Exhibit X

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

FEDERAL HOUSING FINANCE AGENCY, AS CONSERVATOR FOR THE FEDERAL NATIONAL MORTGAGE ASSOCIATION AND THE FEDERAL HOME LOAN MORTGAGE CORPORATION, Plaintiff, v. NOMURA HOLDING AMERICA INC., NOMURA ASSET ACCEPTANCE CORPORATION, NOMURA HOME EQUITY LOAN, INC., NOMURA CREDIT & CAPITAL, INC., NOMURA SECURITIES INTERNATIONAL, INC., RBS SECURITIES INC. (f/k/a/ GREENWICH CAPITAL MARKETS, INC.), DAVID FINDLAY, JOHN MCCARTHY, JOHN P. GRAHAM, NATHAN GORIN, and N. DANTE LAROCCA, Defendants.	11 CIV. 6201 (DLC) **EXPERT REPORT OF KERRY D. VANDELL, Ph.D.**

JULY 9, 2014

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EXPERT REPORT OF KERRY D. VANDELL, Ph.D.

I. QUALIFICATIONS

1. My name is Kerry D. Vandell. I am the Dean's Professor of Finance and Director of the Center for Real Estate at the Paul Merage School of Business, University of California, Irvine. Prior to my current position, I was the Tiefenthaler Chaired Professor of Real Estate and Urban Land Economics at the University of Wisconsin-Madison and former Chairman/Director of the University's Real Estate Department and Center. I received my Ph.D. from M.I.T., where I was the Charles Abrams Fellow at the Joint Center for Urban Studies. I served as President of the American Real Estate and Urban Economics Association and Co-Editor of the Association's journal, *Real Estate Economics*, as well as in a number of other positions in academic and professional organizations, including the Urban Land Institute, the Counselors of Real Estate, the International Council of Shopping Centers, the Real Estate Roundtable, and NAIOP (the Commercial Real Estate Development Association). I was elected a Fellow and member of the faculty of the Weimer School of Advanced Studies in Real Estate and Urban Economics, an honorary academic association which sponsors research symposia by Fellows and invited guests.

2. My areas of research specialization include housing economics and policy, international real estate markets, real estate market dynamics, and mortgage finance, especially mortgage-backed securitization, structured finance, and the pricing of default and prepayment risk. While at the University of Wisconsin, I served on the board of The Park Bank, which had an active mortgage banking program, and served on the bank's loan committee. My Ph.D. dissertation addressed the impact of alternative mortgage instrument designs on homeownership, housing consumption, and the use of mortgage credit. I undertook the first published empirical research on default risk in the commercial mortgage market, and wrote an article, "Default Risk

under Alternative Mortgage Instruments," dealing with the new residential mortgage designs being introduced in the 1970s and published in *The Journal of Finance*. My recent research on real estate illiquidity provides both households and institutional investors with tools to help guide the proper allocation to housing and real estate in mixed-asset portfolios. My work distinguishing real estate value from business enterprise value in the appraisal of complex real property interests has had international influence on tax assessment practices.

3. A copy of my curriculum vitae, including a list of my testimony in the past four years, is attached as **Appendix A**.

4. I am being compensated in this matter at a rate of $800 per hour, including any testimony. Others working under my supervision and direction have assisted me in this matter. I receive additional compensation based on their professional fees associated with my work on this matter. My compensation is not contingent upon the substance of my opinions or the outcome of this case.

II. CASE BACKGROUND

5. According to an Amended Complaint filed on June 28, 2012 (the "Complaint"), [1] the Federal National Mortgage Association ("Fannie Mae") and the Federal Home Loan Mortgage Corporation ("Freddie Mac") (collectively, the "GSEs")[2] purchased seven different residential mortgage-backed securities sponsored Nomura[3] between 2005 and 2007 ("At-Issue

[1] *Federal Housing Finance Agency v. Nomura Holding America Inc. et al.*, Amended Complaint, June 28, 2012 ("Complaint").

[2] This action has been brought by the Federal Housing Finance Agency ("FHFA"), as conservator for Fannie Mae and Freddie Mac.

[3] The Nomura defendants ("Nomura" or "Defendants") include: Nomura Holding America Inc., Nomura Asset Acceptance Corporation, Nomura Home Equity Loan, Inc., Nomura Credit & Capital, Inc., Nomura Securities International, Inc., David Findlay, John McCarthy, John P. Graham, Nathan Gorin, and N. Dante Larocca.

Certificates" or "Securities"). The Securities, which were supported by a variety of collateral types,[4] are:

Securities Purchased by Plaintiff

Trust	Certificate	Loan Group	Purchase Date	Principal Balance	Collateral Type(s)[5]	Asset Type(s)[6]
NAA 2005-AR6	IIIA1	III	11/30/2005[1]	$64,943,000	ARM/Hybrid	Alt-A
NHELI 2006-FM1	IA	I	1/31/2006	$309,550,000	Fixed, ARM/Hybrid, CESL	Subprime
NHELI 2006-FM2	IA1	I	10/31/2006	$525,197,000	Fixed, ARM/Hybrid, CESL	Subprime
NHELI 2006-HE3	IA1	I	8/31/2006	$441,739,000	Fixed, ARM/Hybrid, CESL	Subprime
NHELI 2007-1	II1A	II-1	1/31/2007	$100,548,000	ARM/Hybrid	Alt-A
NHELI 2007-2	IA1	I	1/31/2007	$358,847,000	Fixed, ARM/Hybrid, CESL	Subprime
NHELI 2007-3	IA1	I	4/30/2007	$245,105,000	Fixed, ARM/Hybrid, CESL	Subprime

Note:

[1] Reflects a purchase made by Fannie Mae. All other purchase dates identify purchases made by Freddie Mac.

Source:

[A] *Federal Housing Finance Agency, et al. v. Nomura Holding America Inc., et al.*, Amended Complaint, United States District Court, Southern District of New York, June 28, 2012.
[B] CoreLogic (LoanPerformance).

[4] The collateral supporting the securities include subprime and Alt-A loans. As I discuss below, although there is no standard definition, subprime refers to loans made to borrowers with poor credit histories and, therefore, a higher risk of default than more-creditworthy "prime" borrowers. Like *subprime*, the term *Alt-A* has no standard definition. Generally, however, Alt-A refers to "a general mortgage risk categorization that falls below A, usually because the borrower's income and assets are not fully documented." Jack Guttentag, *The Mortgage Encyclopedia*, 2nd ed. (New York: McGraw-Hill, 2010), p. 14.

[5] The "ARM/Hybrid" collateral type includes Adjustable Rate Mortgage loans in which the interest rate resets periodically, bound by maximum change limits and a maximum rate. It also includes loans that have fixed initial interest rates that are effective for prolonged periods of time (typically 3 to 10 years after funding), but reset periodically after the initial fixed rate period expires. Fabozzi, F., Bhattacharya, K., and Berliner, W., *Mortgage-Backed Securities: Products, Structuring and Analytical Techniques*, 2007, pp. 7 – 8. The "Fixed" collateral type includes loans that have an interest rate that is set at the loan's origination and is constant for the loan's term. Fabozzi, F. and Mann, S., *Handbook of Fixed Income Securities,* Seventh Edition, 2005, p. 488. The "CESL" collateral type includes Closed-End Second Lien loans that are disbursed at origination and amortize over a given term. Fabozzi, Frank, *The Handbook of Mortgage-Backed Securities*, Sixth Edition, McGraw-Hill, 2006, p. 4.

[6] The collateral supporting the securities include subprime and Alt-A loans. As I discuss below, although there is no standard definition, subprime refers to loans made to borrowers with poor credit histories and, therefore, a higher risk of default than more-creditworthy "prime" borrowers. Like *subprime*, the term *Alt-A* has no standard definition. Generally, however, Alt-A refers to "a general mortgage risk categorization that falls below A, usually because the borrower's income and assets are not fully documented." Jack Guttentag, *The Mortgage Encyclopedia*, 2nd ed. (New York: McGraw-Hill, 2010), p. 14.

6. Plaintiff alleges that Nomura issued the Securities and filed prospectuses and registration statements containing false and misleading statements and omissions. In particular, Plaintiff alleges that the "Defendants falsely represented that the underlying mortgage loans complied with certain underwriting guidelines and standards, including representations that significantly overstated the ability of the borrowers to repay their mortgage loans."[7]

7. According to the Complaint, "the overall poor performance of the mortgage loans is a direct consequence of the fact that they were not underwritten in accordance with applicable underwriting guidelines as represented in the Registration Statements."[8]

III. ASSIGNMENT

8. I have been retained by counsel for Nomura, to provide expert testimony in the above-captioned matter. Specifically, I have been asked to:

- Provide an overview of the residential mortgage industry and its principal participants;
- Discuss factors affecting loan performance;
- Describe the factors that contributed to the housing and mortgage market boom of 2000 to 2006, as well as its subsequent decline;
- Describe the impact of the nationwide decline in home prices and the subsequent deterioration in the economy on the incidence of mortgage default;

[7] Complaint, p. 1.

[8] Complaint, p. 46.

- Describe market participants' expectations of future housing market prices during the period immediately preceding the nationwide decline;
- Assess the impact, if any, of the alleged misstatements in the offering documents on the performance of the loans backing the At-Issue Certificates; and
- Evaluate and compare the performance of loans backing the At-Issue Certificates that were assessed by Plaintiff's expert, Mr. Robert W. Hunter to have different reunderwriting results.

9. In forming my opinions, I have reviewed documents and other materials provided through discovery or obtained from public sources. The documents, materials, and other information I have relied upon in conducting my analysis and forming my opinions are cited in this report or listed in **Appendix B**.

IV. SUMMARY OF OPINIONS

10. My opinions are as follows:

11. Governmental policies and favorable economic conditions were among the key factors that resulted in the unprecedented growth in the mortgage market and the unprecedented increase in home prices between 2000 and 2006.

- In support of goals to expand homeownership, government agencies encouraged — even mandated — increased lending to low-income households. Such efforts included directives issued by the Department of Housing and Urban Development ("HUD") for

the government-sponsored enterprises Fannie Mae and Freddie Mac to meet ever-increasing goals for the purchase of home mortgage loans made to low-income and minority households.

- Fannie Mae and Freddie Mac pursued HUD's affordable housing goals in part through the purchase of a significant volume of subprime and other mortgage-backed securities. They also viewed subprime mortgage-backed securities as profitable investment opportunities, and explicitly sought to defend or recapture market share as the mortgage and housing markets boomed.

- Attractive yields and perceived improvements in risk management drew institutional investors to the mortgage securitization market, driving significant growth in demand for mortgage-backed securities.

- Lenders expanded their underwriting guidelines, introduced new mortgage products, and extended credit to higher-risk borrowers. These changes were known to and supported by government agencies, disclosed to market participants, and widely discussed by economists, industry analysts, and regulators.

- Actions of the Federal Reserve, coupled with enormous capital inflows from abroad, led to historically low interest rates, which reduced the cost of borrowing and increased the demand for mortgage credit.

- Increased investor activity in the housing market also contributed to increased housing demand and home price appreciation.
- Steady increases in home values and low unemployment spurred consumer and investor confidence, leading to record levels of mortgage debt.

12. In early 2006, the steady increase in home prices stalled, peaking in April of that year, as uncertainty about the direction of the housing market took hold. In the summer of 2007, home prices began to fall precipitously, leading to an unprecedented collapse in the housing market. Numerous mutually reinforcing factors contributed to the end of the housing boom and the subsequent dramatic decline in home prices and reductions in mortgage lending:

- Steadily increasing home prices moved homeownership out of reach for many prospective buyers, notwithstanding the proliferation of new mortgage products intended to enhance mortgage affordability.
- Higher rates on mortgage loans, driven in part by actions of the Federal Reserve, further reduced affordability.
- Rapid construction led to an inventory of new homes that exceeded buyer demand. The combination of reduced demand and excess supply put downward pressure on home prices.
- As prices softened, investors in non-owner-occupied residential real estate exited the market, further reducing demand.

- In response to changing market conditions, banks tightened their lending standards, making mortgage loans more difficult to obtain.
- Falling home prices and worsening economic conditions triggered an unexpected and unprecedented increase in mortgage delinquency and default rates.
- As home prices declined and defaults increased, the market for mortgage-related securities collapsed.

13. The speed, depth, and systemic nature of the crisis in the housing market affected the financial health of all mortgage market participants. The rapidity and magnitude of the decline, as well as its effect on financial markets and the broader economy, caught most participants by surprise. Even as late as December 2006, many economists and industry participants, including those at the Federal Reserve, Fannie Mae and Freddie Mac, still expected home prices to continue to grow and that any downturn would be brief. Most market participants considered a severe or prolonged housing crisis a remote risk.

14. The data I have examined and the analysis I have conducted show that the main drivers of any decrease in the value of the Securities purchased by the GSEs were not alleged misrepresentations and omissions in the registration statements but rather due to observable loan and borrower characteristics and changes in economic conditions. Specifically:

- I compare the performance of the loan groups supporting the Securities purchased by Plaintiff to the performance of various benchmarks comprised of comparable loans.

- Using the loans in my benchmarks and regression analysis, I estimate the relationship between loan performance and loan and borrower characteristics that were disclosed to the investor at the time of purchase and changes in economic conditions. I then apply the results of the regression model to the loans in the Supporting Loan Groups ("SLGs") of the At-Issue Certificates to determine how these loans should have performed according to each benchmark, which I then compare to their actual performance.

- First I evaluate the performance of the SLGs, using a benchmark comprised of comparable loans that were securitized between 2005 and 2007 (the "Industry Benchmark"), and find that loans in six of the seven At-Issue SLGs, which include 98 percent of the loans underlying the At-Issue Certificates, performed in-line with or better than those loans in the Industry Benchmark. Only the loan group supporting NAA 2005-AR6 Class 3-A-1 experienced a default rate that was statistically significantly higher than expected according to the loans in the Industry Benchmark.

- I perform a similar analysis using a benchmark of comparable loans purchased by the GSEs (the "GSE Benchmark"). This analysis corroborates my Industry Benchmark conclusions. My results show that loans in all seven of the At-Issue SLGs performed in-line with or better than those loans in the benchmark.

- Additionally, I perform a similar analysis in which I compare the performance of the loan groups supporting the At-Issue Certificates to the performance of a benchmark comprised of loans that the Plaintiff's reunderwriting experts identified as not suffering from underwriting defects that substantially increased the credit risk of the loan ("Reunderwriting Benchmark").

- The results of the Reunderwriting Benchmark analysis are consistent with the Industry Benchmark results. Only the loan group supporting NAA 2005-AR6 experienced a default rate that was statistically significantly higher than expected according to this benchmark.

- For the one loan group supporting certificate NAA 2005-AR6 Class 3-A-1, which had a default and serious delinquency rate that was statistically significantly higher than predicted by the Industry and Reunderwriting Benchmarks, I calculate total actual dollar losses of $20.3 million and expected dollar losses of $10.6 as of December 2013 for that loan group based on the Industry Benchmark. I also calculate total actual dollar losses of $17.8 million and expected dollar losses of $9.1 million as of September 2011 for that loan group based on the Industry Benchmark.

- In a separate analysis, I evaluate whether loans at issue in this case identified by Plaintiff's reunderwriting expert, Mr. Hunter, as defective had higher default and serious delinquency rates

compared to loans identified by Mr. Hunter as not materially defective. My analysis accounts for disclosed loan characteristics and changes in market conditions and shows that the default rate of the allegedly defective loans is not statistically significantly different from the default rate of loans identified as not having material defects.

15. My work in this matter is ongoing, and I reserve the right to supplement my analysis should more information become available to me. In the remainder of the report, I expand upon the summary of opinions above and provide the bases for them.

V. AN OVERVIEW OF THE MORTGAGE AND MORTGAGE SECURITIZATION MARKETS

16. A *mortgage* is a loan secured by a home or other underlying asset. Mortgage lenders compete for customers by offering different types of loans and different loan terms, such as fixed or variable interest rates, shorter or longer amortization periods, and lower interest rates or closing costs, to serve various segments of the home-buying market.

17. The mortgage market has many participants: A loan *originator* (*e.g.*, a mortgage *banker* or *broker*) describes the various loan options available to the homebuyer and assists with the application process. An *underwriter* assesses the borrower's ability to repay the loan (generally in accordance with applicable *underwriting guidelines*) and whether the property offered as security provides sufficient collateral in the event of default. A *lending institution* funds the loan. Sometimes the same financial institution plays all of these roles, while in other cases these roles are played by different firms.

18. Access to capital (the money used to make loans) drives the process and provides a first-order segmentation of the lending industry. *Depository institutions*, which include traditional banks, credit unions, and savings and loan associations, take deposits from savers and lend those funds to borrowers. With each new loan, a depository institution may choose whether to hold the loan on its books, adding to its portfolio of loan assets (hence the term "portfolio lender"); sell the loan to an investor; or securitize the loan as part of a residential mortgage-backed security (or "RMBS").[9] *Non-depository institutions*, on the other hand, which include mortgage banks and loan correspondents, do not hold deposits. Their operations are generally funded through lines of credit. Loans that they make are typically sold or securitized.[10]

19. An asset-backed security, such as an RMBS, is a type of investment vehicle in which cash-producing assets are pooled together into a trust. Investors can then purchase securities (also referred to as *certificates*) backed by the cash flows that derive from the underlying assets. In the case of an RMBS, the cash-producing assets are a pool of mortgage loans, which may include first- or second-lien mortgages.[11]

20. *Securitization* is the process of creating a marketable security from a pool of cash-producing assets. In a typical case, the assets are transferred from the originator or *sponsor* to a bankruptcy-remote depositor (typically a special purpose entity) which then transfers the assets to a stand-alone trust. The sponsor, often in conjunction with other parties to the securitization, then determines the structure of the securities or certificates to be issued by the trust, which often

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[9] Anand K. Bhattacharya, Frank J. Fabozzi, and William S. Berliner, "An Overview of Mortgages and the Mortgage Market," in Frank J. Fabozzi, ed., *The Handbook of Mortgage-Backed Securities*, 6th ed. (New York: McGraw-Hill, 2006), p. 16.

[10] *Id*.

[11] A *first* mortgage, or *first-lien* mortgage, has priority over all other mortgages in the event of foreclosure. A *second* mortgage is subordinated to the first. Jack P. Friedman, *et al.*, *Dictionary of Real Estate Terms,* 7th ed. (Hauppauge, NY: Barron's Educational Series, Inc., 2008), pp. 192 and 437.

entails the creation of multiple *tranches* with varying levels of seniority and credit enhancement. The cash flows generated by the underlying assets — in the case of an RMBS, the underlying borrowers' payments of principal and interest — are allocated among investors in accordance with the structure of the securitization.[12] A loan *servicer* collects and distributes payments to an appointed trustee, which in turn distributes the cash flows to investors. Governmental policies and regulations affect every aspect of this process.

21. The market in which RMBS are sold is called the *secondary mortgage market*.[13] The secondary mortgage market includes securities of two types: *agency* securities (*i.e.*, those backed by the federal government or government-sponsored enterprises, including securities issued by trusts established by Fannie Mae or Freddie Mac), and *private-label* or *non-agency* securities (which are not backed by the federal government or government-sponsored enterprises).[14]

22. Fannie Mae and Freddie Mac are often referred to as *government-sponsored enterprises*, or *GSEs*. Each was created by the federal government but later transferred to private ownership. They have shareholders, but — at least until September 2008 — also enjoyed the implicit support of the U.S. Treasury and were therefore able to raise funds at lower interest rates

[12] Cash flows may also derive from sources other than the underlying loans, such as payments from insurers.

[13] The secondary market also includes the "whole loan" market, which generally involves the direct, one-time sale of loans, either individually or in blocks. Jack Guttentag, *The Mortgage Encyclopedia*, 2nd ed. (New York: McGraw-Hill, 2010), p. 281.

[14] For agency securities, timely payment of principal and interest is guaranteed by the specific government agency that established the issuing trust. *Id.* at p. 282. Agency securities also include RMBS guaranteed by the Government National Mortgage Association ("Ginnie Mae").

As a federal agency, Ginnie Mae is backed by the full faith and credit of the U.S. government. Until taken into conservatorship in 2008 (see following note), Fannie Mae and Freddie Mac were privately owned and, while not formally backed by the full faith and credit of the U.S. government, had special authority to borrow from the U.S. Treasury. U.S. Securities and Exchange Commission, "Mortgage-Backed Securities," July 23, 2010, <http://www.sec.gov/answers/mortgagesecurities.htm> (accessed July 9, 2014).

than private firms.[15] Each participates in the secondary mortgage market both through the purchase of mortgage loans from originators, which may be held in portfolio or pooled and sold to investors as RMBS, and through the purchase of RMBS from other issuers. They are each among the largest corporations in the world and have been at the center of considerable controversy both during the inflation of the housing bubble and in the aftermath of its collapse.[16] There nonetheless is little dispute that the GSEs played a significant role in the growth of the secondary mortgage market beginning in the 1970s.

23. Although some observers and market participants expressed concern over the risks associated with securitization, the consensus view at the time was that securitization contributed to the growth and efficiency of the mortgage industry.[17] Without it, the mortgage market would have been confined to so-called *portfolio* lenders, who originate and hold mortgages on their books. The network of mortgage brokers and loan originators that emerged with the secondary mortgage market led to the delivery of lending services to previously

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[15] In September 2008, the Federal Housing Finance Agency placed the GSEs into conservatorship "out of concern that [their] deteriorating financial condition . . . threatened the stability of financial markets." At the time, the GSEs had debt and other financial obligations totaling $5.4 trillion. U.S. Government Accountability Office, "Fannie Mae and Freddie Mac: Analysis of Options for Revising the Housing Enterprises' Long-term Structures," September 2009, p. 1. At that point, the support of the U.S. Treasury was explicit.

[16] For a further discussion of the GSEs and their role in the secondary mortgage market, *see, e.g.*, Jack Guttentag, *The Mortgage Encyclopedia*, 2nd ed. (New York: McGraw-Hill, 2010), pp. 281–286.

[17] Henry Kaufman, for example, expressed concern that securitization would lead to excessive credit creation and lax loan monitoring (Henry Kaufman, "Protecting Against the Next Financial Crisis," *Business Economics*, vol. 34, no. 3 (July 1999), pp. 56–64). Alan Murray, however, refuted Kaufman's concerns, arguing that historical data demonstrated that the risks associated with securitization were minimal (Alan Murray, "Has Securitization Increased Risk to the Financial System?" *Business Economics*, vol. 36, no. 1 (January 2001), pp. 63–67).

Wayne Passmore and Roger Sparks argued that asymmetrical information about loan quality could lead banks to securitize low-quality loans and reduce loan screening (Wayne Passmore and Roger Sparks, "Putting the Squeeze on a Market for Lemons: Government-Sponsored Mortgage Securitization," *Journal of Real Estate Finance and Economics*, vol. 13, no. 1 (1996), pp. 27–43). Other studies examined the relationship between securitization and default risk and found that banks retained loans with higher risk of default, contrary to concerns about adverse selection. *See, e.g.*, Brent Ambrose, Michael Lacour-Little, and Anthony Sanders, "Does Regulatory Capital Arbitrage, Reputation, or Asymmetric Information Drive Securitization?" *Journal of Financial Services Research*, vol. 28, nos. 1–3 (2005), pp. 113–133, which found that securitized loans originated between 1995 and 1997 had lower default rates than those kept in bank portfolios.

underserved markets and provided incentives for specialization, efficiency and cost improvements, and the proliferation of new services and products in response to market demand.[18] Securitization offered enhanced liquidity of the underlying mortgage assets, greater geographic and lender diversification, improved distribution of risk, and reduced ratings volatility (at least prior to 2007), and also expanded the universe of investment grade assets available to investors.[19] The growth of the secondary mortgage market thus had the effect of putting downward pressure on mortgage interest rates, which in turn served to increase the affordability of homes and expand the home-buying market.[20]

24. A final distinction worth noting in the secondary mortgage market is that, while the GSEs themselves guarantee timely payments for the securities they issue, private-label issuers employ a variety of internal and external credit enhancements that provide RMBS investors with a first line of protection against losses suffered by the underlying mortgage pool. Types of credit enhancement included senior/subordinate structures, overcollateralization, special reserves, derivatives, and financial guaranty insurance.[21]

VI. FACTORS AFFECTING LOAN PERFORMANCE AND RISK DISCLOSURES CONCERNING THOSE FACTORS

25. In this section, I discuss factors affecting loan performance and risk disclosures concerning those factors. Individual borrowers may default for a number of reasons. Credit

[18] *See, e.g.*, James Rosenthal and Juan Ocampo, *Securitization of Credit: Inside the New Technology of Finance* (New York: John Wiley & Sons, 1988), pp. 12–23.

[19] For a further discussion of mortgage securitization, *see, e.g.*, Alan Hess and Clifford Smith, Jr., "Elements of Mortgage Securitization," *Journal of Real Estate Finance and Economics*, vol. 1, no. 4 (December 1988), pp. 331–346.

[20] Jack Guttentag, *The Mortgage Encyclopedia*, 2nd ed. (New York: McGraw-Hill, 2010), pp. 282–283.

[21] For a more complete discussion of credit enhancements, *see, e.g.*, Frank J. Fabozzi, "Credit Enhancement for Nonagency MBS Products," in Frank J. Fabozzi, ed., *The Handbook of Mortgage-Backed Securities*, 6th ed. (New York: McGraw-Hill, 2006), pp. 113–126.

trigger events, such as job loss, illness or death in the family, divorce, or excessive spending, increase a borrower's likelihood of defaulting. Mortgage defaults also increase when a borrower's equity is sufficiently negative (*i.e.*, when the value of the home is less than the amount of the mortgage loan).[22,23] This occurs when home prices decrease significantly or when loan balances increase.

26. Defaults are most likely to occur when a credit trigger event and marginal or negative equity coincide.[24] As described in Section VIII, this combination of solvency problems and negative equity occurred across the nation with the large nationwide decrease in housing prices and the recession. An unprecedented decline in real estate prices combined with the contracting economy (and corresponding loss of jobs or reduction in incomes) led to far more mortgage defaults and losses than expected when the Securities were initially offered to investors.[25]

27. While future loan defaults cannot be known with certainty at the time of origination, as described below, the risk of default has been found to be closely related to certain loan, property, and borrower characteristics as well as economic conditions, both local and national. Home price declines, especially in combination with conditions of borrower distress,

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[22] Foote, Christopher, Kristopher Gerardi, and Paul Willen, "Negative Equity and Foreclosure: Theory and Evidence," *Journal of Urban Economics*, Vol. 64, No. 2, September 2008. Deposition of Peter Niculescu at 72:17 – 73:11 (explaining the relationship between declining home prices and expected mortgage losses); Deposition of Kevin Palmer at 629:8 – 629:18 (same).

[23] Note that sufficient equity may lower defaults: even if a borrower experiences a trigger event and has insufficient income, he/she may not default if there is enough equity in the underlying property. *See*, *e.g.*, Feldstein, Martin, "How to Save an 'Underwater' Mortgage," *The Wall Street Journal*, August 7, 2009.

[24] Gerardi, Kristopher, Adam Hale Shapiro, and Paul S. Willen, "Subprime Outcomes: Risky Mortgages, Homeownership Experiences, and Foreclosures," Federal Reserve Bank of Boston Working Paper, No. 07-15, May 4, 2008.

[25] Gerardi, Kristopher, Andreas Lehnert, Shane Sherland, and Paul Willen, "Making Sense of the Subprime Crisis," Federal Reserve Bank of Atlanta Working Paper, No. 2009-2, February 2009.

such as unemployment, and certain loan characteristics, have been found to be dominant as default predictors.

A. Loan Characteristics

1. Type of Loan

28. Certain mortgage products are riskier than others. For example, all else equal, a second-lien loan is riskier than a first-lien loan because a first-lien loan provides the lender with a higher priority claim on the collateral in the event of foreclosure. Similarly, a mortgage product that only requires interest payments for a period of time, rather than both interest and principal repayments, is riskier because it postpones the repayment of principal.

29. The Prospectus Supplements for the Securities disclosed the types of loans underlying the Securities. For example, the NHELI 2006-FM2 Prospectus Supplement disclosed that the "trust will consist of conventional, one-to-four family, fixed rate and adjustable-rate mortgage loans secured by first liens or second liens on residential real properties."[26]

30. The Prospectus Supplements for each of the Securities also disclosed that certain mortgage products may have higher default risks. For example, the NHELI 2007-1 Prospectus Supplement states that 73.17% of the mortgage loans in Loan Group II-1 supporting the security purchased by Plaintiff "…have an initial interest only period. During this period, the payment made by the related borrower will be less than it would be if the related Mortgage Loan amortized." And, "after the initial interest only period, the scheduled monthly payment on these Mortgage Loans will increase, which may result in increased delinquencies by the related borrowers…"[27]

[26] NHELI 2006-FM2 Prospectus Supplement, NOM-FHFA_04638315 at 8321.
[27] NHELI 2007-1 Prospectus Supplement, NOM-FHFA_015141912 at 1956-57.

2. Combined Loan to Value

31. The loan-to-value ("LTV") and the combined loan-to-value ("CLTV") ratios reflect the amount of the loan extended to the borrower relative to the fair market value of the underlying property.[28,29] High rates of property depreciation on a high LTV or high CLTV loan that has experienced little amortization – or negative amortization – can result in borrowers owing more than the value of the property. When this happens, the mortgage is considered "under water." In such a situation, refinancing is difficult and taking out a larger mortgage to pay off an existing mortgage is virtually impossible. Furthermore, when a house is worth less than what is owed on it, the borrower has less of an incentive to continue paying existing loans, especially if the costs of defaulting are low (*e.g.*, if there is no recourse to the borrower's other assets).[30] Therefore, loans with a relatively high CLTV are associated with a higher expected rate of default.[31]

32. The Prospectus Supplements for the Securities disclosed information about the LTV and/or CLTV of the loans underlying the Securities. For example, the NAA 2005-AR6 Prospectus Supplement includes a table that reports the number of mortgage loans that fall into different LTV ranges at origination, as well as the weighted average original LTV ratio. For the loan group supporting certificate NAA 2005-AR6 Class 3-A-1, which was purchased by Fannie Mae, the Prospectus Supplement disclosed that the weighted average LTV was 74.68 percent,

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[28] LTV is the outstanding balance on a loan relative to the property value. CLTV is the outstanding balance of all loans with claims on a property in relation to the property value.

[29] Downes, John and Jordan Goodman, *Dictionary of Finance and Investment Terms*, Seventh Edition, Barron's Educational Series, Inc., 2006, p. 395.

[30] Ambrose, Brent, Charles Capone, and Yongheng Deng, "Optimal Put Exercise: An Empirical Examination of Conditions for Mortgage Foreclosure," *Journal of Real Estate Finance and Economics*, 2001.

[31] Agarwal, Sumit, *et al*., "An Empirical Analysis of Home Equity Loan and Line Performance," *Journal of Financial Intermediation*, 2006, p. 458. Deposition of Gary Kain at 234:21-236:2 ("LTV is a key variable for credit. If appraisals were . . . inflated, LTVs in reality would be higher than what you anticipated and you modeled[,] which would increase your credit risk over what you otherwise would have thought.")

and that one loan had an LTV as high as 95 percent.[32] The Prospectus Supplement did not disclose CLTV, but any CLTVs would be the same or higher. The prospectus states that the rate of defaults "on mortgage loans with high Loan-to-Value Ratios, may be higher than for other types of mortgage loans."[33]

3. Documentation

33. The amount of documentation a borrower provides during the underwriting process can be another indicator of credit quality and risk. A fully documented loan application both discloses and verifies the borrower's income and assets.[34] Documentation programs that enable borrowers to qualify for loans without disclosing and verifying income and assets increased in popularity until 2007. Consistent with expectations, the academic literature and industry analysts' studies have shown that loans issued to borrowers who provided less than full documentation as part of their applications are more likely to default than borrowers with fully documented applications.[35] Prior to and during the time the Securities were offered to investors, observers noted publicly that loans issued to borrowers who provided less than full documentation were riskier.[36] Lenders such as Countrywide also noted publicly that loans issued to borrowers who provided less than full documentation were riskier.[37]

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[32] NAA 2005-AR6 Prospectus Supplement, NOM-FHFA_04811802 at 1861.

[33] NAA 2005-AR6 Prospectus, NOM-FHFA_04811802 at 1994.

[34] *See, e.g.*, NHELI 2006-HE3 Prospectus Supplement, NOM-FHFA_04620885 at 0967.

[35] *See, e.g.,* Mayer, Christopher, Karen Pence, and Shane Sherlund, "The Rise in Mortgage Defaults," *Journal of Economic Perspectives*, Volume 23, Number 1, Winter 2009, pp. 43, 44. *See also* "City National Corporation – Initial Coverage with Neutral Rating," Credit Suisse, June 15, 2010, p. 5.

[36] For example, an article in the San Jose Mercury News stated: "But it's an open secret in the mortgage business that some applicants for stated income loans will give an inflated estimate of their monthly income so that they can qualify for the loan amount they want. Doing so might allow them to buy a house in a better school district than they could otherwise afford, for example. They may reason that they can afford a bigger monthly payment than traditional underwriting guidelines will allow them. Or they may be betting that their income will increase soon. At any rate, there's a potential risk for both borrower and lender." McAllister, Sue, "Loans Without Proof of Income,"

34. The Prospectus Supplements for the Securities provided information on the documentation of the underlying loans. For example, the Prospectus Supplement for NHELI 2007-2 identifies the type of documentation for each loan as being one of the following: "Full/Alt," "Verified Income/Stated Assets," "Stated Income, Verified Assets," "Stated/Stated Documentation," "No Ratio," or "No Documentation." Only 46.06 percent of the collateral backing the certificate Freddie Mac purchased from that securitization was originated under the full documentation program.[38,39]

4. Occupancy Status

35. Borrowers typically secure mortgages to finance a home that serves as their residence, a second home, or as an investment property. The academic literature provides evidence that loan purpose is a relevant factor in determining default risk. Borrowers obtaining credit for a primary residence are typically less likely to default than borrowers using the loan for investment properties.[40]

San Jose Mercury News, November 26, 2004; 1E. *See also* Andrews, Edmund L., "A Hands-Off Policy on Mortgage Loans," *The New York Times*, July 15, 2005.

[37] For example, in March 2006, Countrywide CEO Angelo Mozilo said "there's an increased risk on stated income [loans] because you're really, at the end of the day, [you] really don't know what's really going on." p. 71 CFC – Countrywide Financial Equity Investor Forum, Conference Call Transcript, Thomson StreetEvents, March 30, 2006. *See also*, Kenneweg at 332:5-10 (stating that one of the risks with stated income loans is that borrowers may misstate their income); Norris at 283:6-283:13 (stated income loans were called "liar loans").

[38] NHELI 2007-2 Prospectus Supplement, NOM-FHFA_05591325 at 1392.

[39] Documentation Programs are defined as follows: "Certain of the Mortgage Loans have been originated under reduced documentation, no-documentation or no-ratio programs, which require less documentation and verification than do traditional full documentation programs. Generally, under a reduced documentation program, verification of either a borrower's income or assets, but not both, is undertaken by the originator. Under a no-ratio program, certain borrowers with acceptable compensating factors will not be required to provide any information regarding income and no other investigation regarding the borrower's income will be undertaken. Under a no-documentation program, no verification of a borrower's income or assets is undertaken by the originator. The underwriting for such Mortgage Loans may be based primarily or entirely on an appraisal of the Mortgaged Property, the loan-to-value ratio at origination and/or the borrower's credit score." NOM-FHFA_05591325 at 1417.

[40] Mayer, Christopher, Karen Pence, and Shane Sherlund, "The Rise in Mortgage Defaults," *Journal of Economic Perspectives*, Volume 23, Number 1, Winter 2009, p. 44.

36. Information on the percentage of mortgages for properties intended to be used as primary residences was provided in the Prospectus Supplements for the Securities. For example, the NHELI 2007-2 Prospectus Supplement reports that 91 percent of the mortgages backing the GSE-purchased certificate were owner-occupied (or, for purchase money loans, were intended to be owner-occupied).[41]

B. Borrower Characteristics

37. Borrower characteristics, such as credit history, also affect default risk. The FICO score, developed by Fair Isaac and Company, is a credit score assigned to a borrower, which lenders use to determine how much, if any, credit to grant. The score is assigned to the applicant by an independent credit assessor (*e.g.,* a third-party firm, the credit grantor itself, or a credit bureau in cooperation with the credit grantor) and takes into account factors such as income, assets, length of employment, length of living in one place, and credit history. Events such as bankruptcy or tax delinquency would negatively affect an applicant's credit score.[42] All else equal, the higher a borrower's FICO score, the more creditworthy the borrower and the less likely he/she is to default than a borrower with a lower FICO score.[43]

38. The Prospectus Supplements for the Securities provided information about the FICO scores of the underlying borrowers in conjunction with other data on loan characteristics. For example, the Prospectus Supplement for NHELI 2006-HE3 includes a table that reports the number of mortgage loans that fall into different FICO score ranges at the time of origination.

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[41] NHELI 2007-2 Prospectus Supplement, NOM-FHFA_05591325 at 1378.

[42] Downes, John and Jordan Goodman, *Dictionary of Finance and Investment Terms*, Seventh Edition, Barron's Educational Series, Inc., 2006, pp. 153-154.

[43] Agarwal, Sumit, *et al*., "An Empirical Analysis of Home Equity Loan and Line Performance," *Journal of Financial Intermediation*, 2006, p. 458.

The borrowers of loans serving as collateral backing that Freddie Mac-purchased certificate had an average FICO score of 607.[44]

C. Economic Conditions

1. General Macroeconomic Conditions

39. Deteriorating macroeconomic conditions increase the likelihood of default. For example, academic research finds a positive relationship between the unemployment rate (which is a measure of macroeconomic conditions) and the likelihood of default.[45,46] Unemployment can be the cause of a "credit event" by precipitating default, particularly if the borrower's equity is marginal or negative.[47] It can also adversely affect demand for housing, which would put downward pressure on real estate prices.

40. The offering documents for the Securities warn of macroeconomic risks. For example, the Prospectus for NHELI 2007-2 notes that "adverse economic conditions may prevent certain mortgagors from making timely payments on their loans. If that happens, the rates of delinquencies, foreclosures and losses in any trust fund may increase."[48] The Prospectus for NHELI 2007-2 also discloses the risk that a decline in macroeconomic conditions, in states with significant concentrations of loans underlying the Securities, may "affect the ability of borrowers to repay their loans on time;"[49] The Prospectuses identify unemployment as one of

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[44] NHELI 2006-HE3 Prospectus Supplement, NOM-FHFA_04620885 at 0932.

[45] Agarwal, Sumit et al., "An Empirical Analysis of Home Equity Loan and Line Performance," *Journal of Financial Intermediation*, 2006, p. 462.

[46] Ambrose, Brent W. and Charles Capone, "The Hazard Rates of First and Second Defaults," *Journal of Real Estate Finance and Economics*, 2000.

[47] Deposition of Peter Niculescu at 51:20 – 52:16 (employment is determinate of credit loss); Deposition of Raymond Romano at 305:19-306:7 (employment factors could cause rising delinquencies).

[48] NHELI 2007-2 Prospectus, NOM-FHFA_05591325 at 1568.

[49] NHELI 2007-2 Prospectus, NOM-FHFA_05591325 at 1361.

the economic risks that could affect the value of the Securities.[50] These and other disclosures warn that an economic downturn would adversely affect the Securities.

2. Real Estate Prices

41. As explained in Section VII, real estate prices appreciated significantly prior to 2006 and subsequently experienced a dramatic, sustained, and unexpected decline. Empirical evidence and deposition testimony confirm that, as house prices decline, default rates increase.[51] The offering documents for the Securities disclosed that an overall decline in residential real estate values could adversely affect the value of the Securities. For example, the Prospectus for NHELI 2006-FM2 states that, "if property values decline, the actual rates of delinquencies, foreclosures and losses on all underlying loans could be higher than those currently experienced in the mortgage lending industry in general."[52]

VII. RAPID GROWTH OF THE HOUSING MARKET

42. The U.S. housing market experienced unprecedented growth from the late 1990s through early 2006, fueled by a variety of policy and macroeconomic factors that increased the

[50] The Prospectuses contain statements such as the following: "The risk of delinquencies and loss is greater and prepayments are less likely in regions where a weak or deteriorating economy exists, as may be evidenced by, among other factors, increasing unemployment or falling property values." *See*, for example, NAA 2005-AR6 Prospectus, NOM-FHFA_04811802 at 1994.

[51] Gerardi, Kristopher, Adam Hale Shapiro, and Paul S. Willen, "Subprime Outcomes: Risky Mortgages, Homeownership Experiences, and Foreclosures," Federal Reserve Bank of Boston Working Paper, No. 07-15, May 4, 2008. Deposition of Gary Kain at 142-143 (home price was a "key factor" in market losses); Deposition of Kevin Palmer at 661-63 (Housing price appreciation "dominant" factor in losses); Deposition of Eric Rosenblatt at 185-87 (impact of housing price changes on portfolio "super big"); Deposition of Lin Cao at 270-71 (increase in defaults caused by drop in home prices); *See also,* Ex. 20256, Special Litigation Committee of the FHLMC Document, Exhibit A of Derivative Litigation Motion to Dismiss, p. 31 ("The consensus among the current and former officers and directors of Freddie Mac interviewed by the committee was that the primary cause of the company's recent losses was an 'exogenous macroeconomic event'; namely, the unprecedented decline in the housing market. Specifically between 2006 and May 2008, house prices fell nationwide by approximately 25 percent. This is the largest, and only, nationwide decline in house prices since the Great Depression.")

[52] NHELI 2006-FM2 Prospectus, NOM-FHFA_04638315 at 8525.

availability and affordability of mortgage loans and, by extension, expanded the pool of potential homebuyers. This unprecedented growth was followed by a similarly unprecedented decline, the suddenness and severity of which were generally unexpected by bankers, regulators, economists and investors. In this section, I discuss the magnitude of the housing boom and consider the factors that caused it. In the following section, I discuss the magnitude and suddenness of the subsequent decline and consider the factors that caused it.

A. The Metrics of Growth: Homeownership, Home Prices, Mortgage Lending, and Mortgage Securitization

43. The breadth of the expansion in the mortgage and housing industries during the late 1990s and early 2000s can be measured by observed growth in homeownership in the U.S., the appreciation of home prices, growth in the mortgage lending industry, and growth in mortgage loan securitizations.

1. Homeownership rates grew substantially from the mid-90s through 2004.

44. Through the early 1990s, the homeownership rate in the U.S. hovered at approximately 64 percent.[53] In 1995, it began to rise, reaching a peak in 2004 of approximately 69 percent, where it hovered until the housing market stalled in 2006. See **Exhibit 1**. The increase was among the factors that contributed to the creation of approximately 10.4 million additional owner-occupied households in the U.S. during the same period.[54]

[53] U.S. Census Bureau, Housing Vacancies and Homeownership (CPS/HVS), Historical Tables, Table 14: Homeownership Rates for the U.S. and Regions: 1965 to Present, available at <http://www.census.gov/housing/hvs/data/histtabs.html>.

[54] The estimate of 10.4 million represents the net change in owner-occupied homes from the end of 1994 through 2004. *See* U.S. Census Bureau, Estimates of The Total Housing Inventory for the United States: 1965 to Present, Current Population Survey, Series H-111, available at <http://www.census.gov/housing/hvs/data/ histtab7.xls> (accessed July 9, 2014).

2. Home prices appreciated rapidly from 2000 to 2006.

45. Triggered in part by the increase in demand for homes, as well as a steady decline in long-term interest rates, home prices in the U.S. began to appreciate rapidly. From 1945 through the end of 1999, home prices in the U.S. had grown at an average annual rate of approximately 4.9 percent; from 2000 through the end of 2005, home prices grew at more than twice that rate, an average of 11.3 percent per year.[55] See **Exhibit 2**. In some cities, the rate was even higher. See **Exhibit 3**.

3. Rising home prices and expanded homeownership were accompanied by rapid growth of the U.S. mortgage market.

46. Home price appreciation and expanded homeownership were accompanied by rapid growth of the mortgage lending market. From 2000 through the first quarter of 2008, aggregate mortgage debt in the United States more than doubled, from approximately $4.5 trillion to $10.7 trillion. See **Exhibit 4**. As a percentage of gross domestic product, mortgage debt grew from less than 50 percent in the late 1990s to almost 80 percent in 2007. See **Exhibit 5**. The increase included significant growth in the volume of both loans used to purchase a home and loans taken against the value of a home for purposes other than purchase. Total origination volume for all residential mortgage loan types, including first- and second-lien mortgages, grew from just over $1 trillion in 2000 to almost $4 trillion in 2003, including a refinance volume of more than $2.8 trillion. See **Exhibit 6**. Total volume of home equity loan

[55] The home price statistics quoted in this report and the data used to develop the accompanying exhibits derive generally from Case-Shiller Home Price Indices, available at <http://us.spindices.com/index-family/real-estate/sp-case-shiller> (accessed July 9, 2014), or data available at Robert J. Shiller's website <http://irrationalexuberance.com/> (accessed July 9, 2014). Other home price indices generally followed similar trends.

originations grew from approximately $50 billion in 2000 to more than $430 billion at its peak in 2006. See **Exhibit 7**.

4. The securitization of residential mortgage loans increased dramatically.

47. With growth in the origination of residential mortgage loans came growth in securitization. Securitization of residential mortgage loans increased dramatically beginning in the mid-90s, peaking at more than $2.7 trillion in 2003. After falling back in 2004, volumes again topped $2.0 trillion in 2005 and 2006. See **Exhibit 8**. Similarly, through the 1990s and early 2000s, typically 50 to 60 percent of new mortgage originations were securitized; by 2003, the rate was 67.5 percent, suggesting that investor demand for RMBS outpaced even the growing demand for homes and mortgage loans. See **Exhibit 9**.

48. The securitization of home equity loans also increased dramatically, from $15.5 billion in 2001 to $74.2 billion in 2006, as investor demand for securities backed by such loans kept pace with homeowners' demand for second-lien mortgages and lines of credit. See **Exhibit 10**.

B. Factors Contributing to Ownership Expansion, Price Appreciation, and Mortgage and Securitization Growth

49. Numerous policy and macroeconomic factors converged to produce the unprecedented growth described above, including tax and regulatory policies designed to encourage homeownership; policies that encouraged — even mandated — lending to low-income households; a resulting relaxation of underwriting guidelines; and a proliferation of alternative mortgage products created to meet market demand. This evolution of the market was widely discussed by academics, industry analysts, market participants (including the GSEs), and regulators. At the same time, historically low interest rates combined with low levels of

unemployment to drive heightened consumer confidence. That confidence led to an increased desire to spend and a willingness to take on significant new debt. I discuss these factors in greater detail in the sections that follow.

1. Governmental policies supported an expansion of homeownership.

50. Homeownership has long been considered an integral part of the American Dream. President Lyndon Johnson once called it "a cherished dream and achievement of most Americans."[56] President Clinton argued that homeownership "[goes] to the heart of what it means to harbor, to nourish, to expand the American Dream."[57] President George W. Bush called homeownership "a foundation for families and a source of stability for communities."[58]

51. The benefits of homeownership extend beyond the economic interests of owners. As then-Federal Reserve Chairman Alan Greenspan remarked in 2002:

> Where home ownership flourishes, it is no surprise to find increased neighborhood stability, more civic-minded residents, better school systems, and reduced crime rates. . . . With these important benefits, an increased rate of home ownership has been chosen by our society as a national priority, with many public- and private-sector resources devoted to achieving this goal.[59]

52. The U.S. government has long encouraged homeownership through a combination of tax incentives, regulatory initiatives, public programs, and public-private partnerships. Such policies form an essential backdrop to the later actions of market participants,

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[56] Lyndon B. Johnson, "The Crisis of the Cities," Special Message to the Congress on Urban Problems, February 22, 1968.

[57] U.S. Department of Housing and Urban Development, "Homeownership and Its Benefits," Urban Policy Brief, No. 2, August 1995, citing a speech to the National Association of Realtors in November 1994.

[58] The White House, "President Focuses on Home-Ownership in Radio Address," June 15, 2002, <http://georgewbush-whitehouse.archives.gov/news/releases/ 2002/06/20020615.html>.

[59] Alan Greenspan, "Economic Development and Financial Literacy: Remarks at the Ninth Annual Economic Development Summit, The Greenlining Institute, Oakland, California," January 10, 2002. *See also, e.g.*, Richard K. Green and Michelle J. White, "Measuring the Benefits of Homeowning: Effects on Children," *Journal of Urban Economics*, vol. 41, no. 3 (1997), pp. 441–461.

which led, directly and indirectly, to the increase in housing demand and the acceleration of home price appreciation.

53. A key example is the Tax Reform Act of 1986 (the "TRA"), President Reagan's signature tax initiative, which extended taxpayers' right to deduct mortgage interest and — perhaps more importantly — eliminated the deduction of interest on other types of consumer loans. By making mortgage debt a bargain relative to other consumer loans, the TRA stimulated demand not only for standard purchase-money mortgages but also for loans backed by owners' accumulated equity in their homes.[60] In essence, the TRA enshrined homeownership as a valuable and relatively accessible tax shelter.[61] The benefit to residential mortgage borrowers is substantial; Congress estimates that taxpayer savings attributable to the mortgage interest deduction totaled more than $300 billion from 2000 to 2004, and more than $430 billion from 2005 to 2009, making it the third largest federal income tax expenditure behind exclusions for pension contributions and healthcare insurance.[62]

54. An increase in low- and moderate-income loan volume can also be traced to the Clinton and George W. Bush administrations' programs to increase the rate of homeownership among low-income households. The Clinton Administration, for example, initiated both the National Homeownership Strategy and the Passport to Homeownership, designed to make

[60] *See, e.g.*, Kenneth Temkin, Jennifer E. H. Johnson, and Diane Levy, "Subprime Markets, the Role of GSEs, and Risk-Based Pricing," The Urban Institute, March 2002, p. 8: "[The Act] provided an incentive for homeowners to take home equity loans and use the proceeds to pay off consumer debt, which usually has higher interest rates than home equity debt."

[61] Edward L. Glaeser and Joseph Gyourko, "*Rethinking Federal Housing Policy: How to Make Housing Plentiful and Affordable*," (Washington, D.C.: The AEI Press, 2008), pp. 88–89.

[62] Joint Committee on Taxation, "Background Information on Tax Expenditure Analysis and Historical Survey of Tax Expenditure Estimates," February 28, 2011, tables 6–7. Property tax deductions and capital gains exclusions also contribute to the tax advantages of home ownership.

buying homes easier and more affordable.[63] The Bush Administration created the American Dream Down Payment Fund, which provided $200 million annually to help first-time buyers with down payments and closing costs.[64]

55. Governmental policies have encouraged homeownership by other means as well. The Federal Housing Administration ("FHA"), for example, which was created during the Great Depression, has long insured loans with low down payments and high LTV ratios.[65] Throughout the housing boom, FHA guidelines permitted homebuyers to borrow up to 97 percent of the appraised value of the home, well above the traditional limit of 80 percent for a conforming loan without private mortgage insurance.[66]

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[63] William J. Clinton, "Remarks on the National Homeownership Strategy," June 5, 1995 <www.presidency.ucsb.edu/ws/?pid=51448> (accessed July 9, 2014); and U.S. Department of Housing and Urban Development, "HUD and MBA Announce Passport to Homeownership Initiative to Educate Consumers About the Mortgage Lending Process," November 12, 1999 <http://archives.hud.gov/news/1999/pr99-231.html> (accessed July 9, 2014).

[64] The White House, "President Focuses on Home-Ownership in Radio Address," June 15, 2002, <http://georgewbush-whitehouse.archives.gov/news/releases/2002/06/20020615.html> (accessed July 9, 2014); and U.S. Department of Housing and Urban Development, "American Dream Downpayment Initiative," <http://portal.hud.gov/hudportal/HUD?src=/program_offices/comm_planning/affordablehousing/programs/home/addi> (accessed July 9, 2014).

The Bush Administration also promoted the development of new mortgage products that provide conventional market alternatives to combat the predatory loans that were disproportionately directed toward minority borrowers. *See, e.g.*, Jo Becker, *et al.*, "White House Philosophy Stoked Mortgage Bonfire," *The New York Times*, December 21, 2008; and Edwin Chen and James Gerstenzang, "Bush Campaign Promotes Great American Dream," *Los Angeles Times*, June 16, 2002.

[65] U.S. Department of Housing and Urban Development, "The Federal Housing Administration (FHA)," <http://portal.hud.gov/hudportal/ HUD?src=/program_offices/ housing/fhahistory>.

[66] The FHA lowered the down payment requirement to five percent in the 1950s and to three percent in 1961. (Kerry D. Vandell, "FHA Restructuring Proposals: Alternatives and Implications," *Housing Policy Debate*, vol. 6, no. 2 (1995), pp. 299–393, at 303–304.) In 2008, the minimum down payment was increased to 3.5 percent. N. Eric Weiss, et al., CRS Report for Congress: Housing and Economic Recovery Act of 2008, Congressional Research Service, August 19, 2008, p. 14, available at <http://assets.opencrs.com/rpts/RL34623_20080819.pdf> (accessed July 9, 2014).

A *conforming* loan is one that meets GSE guidelines for purchase. Loans that do not meet GSE guidelines (including loans above a certain pre-determined limit, called "jumbos") are non-conforming loans. Jack Guttentag, *The Mortgage Encyclopedia*, 2nd ed. (New York: McGraw-Hill, 2010), pp. 40–41, 114, 191.

56. The degree to which these initiatives contributed to the observed increase in homeownership in the U.S. leading up to the housing crisis has been the subject of considerable debate. Edward Glaeser of Harvard University and Jesse Shapiro of the University of Chicago have argued, for example, that the mortgage interest deduction has had little measurable effect on homeownership.[67] A staff report to the House Committee on Oversight and Government Reform, on the other hand, concluded that low-down-payment programs (as well as lower lending standards) contributed not only to homeownership gains but also to rapid home-price appreciation as well.[68] Regardless, homeownership gains during this period were observed across numerous demographic groups, including low-income borrowers. See **Exhibit 1**.[69]

2. Governmental policies encouraged lending to low-income households.

(a) The Community Reinvestment Act

57. In support of the effort to increase homeownership, the federal government also encouraged — and in some cases mandated — lenders to serve a broader population of borrowers. The landmark Community Reinvestment Act of 1977 (the "CRA"), for example, required federally insured banking institutions to "help meet the credit needs of the communities

[67] Edward L. Glaeser and Jesse M. Shapiro, "The Benefits of the Home Mortgage Interest Deduction," NBER Working Paper Series, Working Paper 9284 (October 2002), pp. 40–41.

[68] U.S. House of Representatives Committee on Oversight and Government Reform: The Role of Government Affordable Housing Policy in Creating the Global Financial Crisis of 2008, Staff Report, May 12, 2010, pp. 8–11.

[69] *See also*, *e.g.*, Ben S. Bernanke, "The Subprime Mortgage Market," Speech at the Federal Reserve Bank of Chicago's 43rd Annual Conference on Bank Structure and Competition, May 17, 2007 <http://www.federalreserve.gov/newsevents/speech/bernanke20070517a.htm> (accessed December July 9, 2014): "The increase in homeownership has been broadly based, but minority households and households in lower-income census tracts have recorded some of the largest gains in percentage terms."

in which they operate, including low- and moderate-income neighborhoods, consistent with safe and sound banking operations."[70]

58. Although the CRA was enacted long before the growth in homeownership that occurred in the late 1990s and early 2000s, it again provides a necessary backdrop to the later actions of regulators and market participants.[71] Following the release of a 1992 study by the Federal Reserve Bank of Boston documenting alleged racial discrimination in mortgage lending among Boston-area banks, the federal government undertook a number of actions to increase enforcement of the CRA.[72] The Board of Governors of the Federal Reserve System ("the Fed"), for example, denied several banks' applications to open new branches or merge with other banks due to inadequate performance under the CRA.[73] The Clinton Administration pushed for stricter adherence to the CRA by stepping up enforcement of fair housing and fair lending laws.[74]

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[70] Federal Financial Institutions Examination Council, "Community Reinvestment Act: Background and Purpose," <http://www.ffiec.gov/CRA/history.htm> (accessed July 9, 2014). *See also* Robert B. Avery, Paul S. Calem, and Glenn B. Canner, "The Effects of the Community Reinvestment Act on Local Communities," Board of Governors of the Federal Reserve System, Division of Research and Statistics, March 20, 2003, p. 1

[71] While some argue otherwise (*see*, *e.g.*, Sumit Agarwal, et al., "Did the Community Reinvestment Act (CRA) Lead to Risky Lending?," NBER Working Paper 18609 (December 2012)), most research has concluded that the CRA was not the cause of the financial crisis, but merely one of many contributing factors. *See, e.g.*, Neil Bhutta, "The Community Reinvestment Act and Mortgage Lending to Lower Income Borrowers and Neighborhoods," *Journal of Law and Economics*, vol. 54, no. 4 (November 2011), p. 953.

[72] Peter Passell, "Race, Mortgages and Statistics; The Unending Debate Over a Study of Lending Bias," *The New York Times*, May 10, 1996 (discussing Alicia H. Munnell, *et al.*, "Mortgage Lending in Boston: Interpreting HMDA Data," *The American Economic Review*, vol. 86, no. 1 (March 1996), pp. 25–53).

[73] *See, e.g.*, "Fed Denies Gore-Bronson Bancorp Acquisition Plan," *Dow Jones News Service*, August 13, 1992; "Fed Cites Bias in Denying Branch Application," *Los Angeles Times*, February 10, 1993; and "Fed Bars Acquisitions," *The Wall Street Journal*, May 19, 1993.

[74] *See, e.g.*, Ronald Brownstein, "Minorities' Home Ownership Booms Under Clinton but Still Lags Whites'," *Los Angeles Times*, May 31, 1999; and Peter Passell, "Race, Mortgages and Statistics; The Unending Debate Over a Study of Lending Bias," *The New York Times*, May 10, 1996.

Actions such as these gave lenders a powerful incentive to turn their attention toward underserved neighborhoods.[75]

(b) Affordable Housing Goals

59. Additionally, beginning in 1993, in accordance with the Federal Housing Enterprises Financial Safety and Soundness Act, HUD set first-ever quantifiable goals for the GSEs to support affordable housing.[76] From 1993 to 1995, Fannie Mae and Freddie Mac were directed to ensure that at least 30 percent of the mortgages they purchased were made to low- and moderate-income families.[77] The goal was increased to 40 percent in 1996, to 42 percent in 1997, to 50 percent in 2001, and up to 56 percent by 2008.[78] All but the last of these goals were met by one or both of the GSEs.[79] See **Exhibit 11**. Additional goals were set for underserved areas and "special affordable households."[80] The GSEs' pursuit of HUD's affordable lending

[75] Robert B. Avery, Paul S. Calem, and Glenn B. Canner, "The Effects of the Community Reinvestment Act on Local Communities," Board of Governors of the Federal Reserve System, Division of Research and Statistics, March 20, 2003, pp. 8, 10.

[76] Federal Housing Enterprises Financial Safety and Soundness Act of 1992, 12 U.S.C. § 1331 *et seq*.

[77] Ira G. Peppercorn, Statement Before the House Subcommittee on Capital Markets, Securities and Government Sponsored Enterprises, Committee on Banking and Financial Services, July 30, 1998, <http://democrats.financialservices.house.gov/banking/73098hud.shtml> (accessed July 9, 2014). The initial 30 percent goal was set by Congress. *Id*.

[78] U.S. Department of Housing and Urban Development, Overview of the GSEs' Housing Goal Performance, 1993–2001, July 2002, p. 2, available at <http://www.huduser.org/datasets/GSE/gse2001.pdf> (accessed July 9, 2014); and U.S. Department of Housing and Urban Development, Overview of the Enterprises' Housing Goal Performance, 2001–08, August 2009, p. 4, available at <http://www.fhfa.gov/webfiles/15465/ Overview%20of%202001-2008%20Goal%20Performance.pdf>.

[79] The GSEs fell short of the goals set for 2008. The Federal Housing Finance Agency, however, subsequently concluded that most of the goals for 2008 were "infeasible." See Federal Housing Finance Agency, "2008 Housing Goal Performance for Fannie Mae and Freddie Mac," p. 1, available at <http://www.fhfa.gov/webfiles/15547/2008%20ENTERPRISE%20HOUSING%20GOAL%20PERFORMANCE.pdf>.

[80] U.S. Department of Housing and Urban Development, Overview of the GSEs' Housing Goal Performance, 1993–2001, July 2002, p. 2, available at <http://www.huduser.org/datasets/GSE/gse2001.pdf> (accessed July 9, 2014); and U.S. Department of Housing and Urban Development, Overview of the Enterprises' Housing Goal Performance, 2001–08, August 2009, p. 4, available at <http://www.fhfa.gov/webfiles/15465/ Overview%20of%202001-2008%20Goal%20Performance.pdf>. "Special Affordable" households were defined as households with income less than or equal to 60 percent of area median income or located in a low-income area and having income less than or equal to 80 percent of area median income. *Id*.

goals was cited as one factor contributing to gains among low-income and minority families in the mortgage market.[81],[82]

i. Whole-loan purchases

60. The housing goals ultimately led Fannie and Freddie to loosen underwriting standards on the loans they purchased. In 1999, for example, under pressure from the Clinton administration, Fannie Mae announced that it would reduce credit requirements on the loans it purchased, thereby encouraging lenders to offer loans to borrowers with lower credit scores.[83] Borrowers would pay rates only one percentage point higher than rates on conventional mortgages, and have the one-point premium dropped after two years of timely payments.[84] Then-chairman and chief executive officer of Fannie Mae, Franklin Raines, announced that the purpose of the program was to increase the affordability and availability of homes:

> Fannie Mae has expanded home ownership for millions of families in the 1990's by reducing down-payment requirements . . . . Yet there remain too many borrowers whose credit is just a notch below what our underwriting has required who have been relegated to paying significantly higher mortgage rates in the so-called subprime market.[85]

61. In its 2000 Report to Congress, OFHEO described the changes Fannie and Freddie had undertaken:

> In an effort to increase the volume of mortgages they purchase, Fannie Mae and Freddie Mac have expanded the range of loans they buy. Both Enterprises have introduced new products such as

[81] *See* Harold L. Bunce, "The GSEs' Funding of Affordable Loans: A 2004–05 Update," U.S. Department of Housing and Urban Development, Office of Policy Development and Research, June 2007, p. 7.

[82] Deposition of Richard Syron at 230-233 (housing goals forced Freddie to take on riskier loans); Deposition of Lin Cao at 192-93 (Fannie PLS had more risk because of housing goals).

[83] Steven A. Holmes, "Fannie Mae Eases Credit To Aid Mortgage Lending," *The New York Times*, September 30, 1999.

[84] *Id*.

[85] *Id*.

> low-downpayment and reverse mortgages. Fannie Mae and Freddie Mac have also purchased loans that they previously deemed to pose an unacceptable level of credit risk, including some subprime mortgages.[86]

62. The effect of these policies on the mortgage market was significant. From 1995 to 2003, the GSEs' purchases and securitization of whole loans increased dramatically, from a combined total of approximately $269 billion to more than $2.1 trillion, an increase of almost 800 percent.[87] See **Exhibit 8**. Fannie Mae's securitization volume alone increased nearly 1000 percent.[88] At their peak in 2003, the GSEs purchased and securitized a combined total of approximately 54 percent of all new mortgage loan originations.[89] See **Exhibit 9**.

63. During the ensuing three years, from 2004 through 2006, agency purchases of whole loans declined. In 2004, the GSEs purchased and securitized just over $1 trillion in residential mortgage loans, less than half the total from just one year earlier. See **Exhibit 8**. The GSEs also purchased and securitized a smaller *percentage* of new mortgage loan originations,

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[86] Office of Federal Housing Enterprise Oversight, 2000 Report to Congress, June 15, 2000, p. 13, available at <http://www.fhfa.gov/webfiles/1212/AR2000.pdf>. Moreover, OFHEO explicitly acknowledged the risks associated with these changes:

> The next national downturn will be the first major test of the changes in credit risk management and new loan products introduced by Fannie Mae and Freddie Mac in the 1990s. A recession could be accompanied by higher interest rates, stagnant household incomes, rising consumer debt burdens, higher unemployment, and a stagnant or declining stock market. Such conditions could reduce the demand for housing, dampen or reverse home price appreciation, and increase delinquency and foreclosure rates and mortgage credit losses.

Id. atp. 18.

[87] **Exhibit 8** depicts the GSEs' securitization volume — *i.e.*, the GSEs' combined issuances of RMBS. The GSEs' total issuances of RMBS closely track their combined volume of whole loan purchases. See Federal Housing Finance Agency, Report to Congress 2012, June 13, 2013, pp. 75, 79, 92, and 96, available at <http://www.fhfa.gov/webfiles/25320/ FHFA2012_AnnualReport-508.pdf>.

[88] *See* Inside Mortgage Finance, The 2013 Mortgage Market Statistical Annual CD-ROM, Volume 2A.

[89] **Exhibit 9** depicts agency and non-agency RMBS issuances as a percentage of total new mortgage loan originations.

falling from a near-term peak of 54 percent in 2003 to less than 35 percent in 2004, and to just over 30 percent in both 2005 and 2006. See **Exhibit 9**.

64. The sudden shift can be attributed in part to growing criticism of the GSEs' financial operations in the early 2000s, including questions of capital adequacy and a lack of proper hedging mechanisms, which resulted in pledges to reduce the growth of their portfolios.[90] Many feared, simply, that the GSEs had grown too large.[91]

65. With consumer and investor demand continuing, however, private-label issuers of RMBS stepped up their securitization of mortgage loans. Non-agency issuances of RMBS more than doubled in just two years, from $586 billion in 2003 to approximately $1.2 trillion in 2005. See **Exhibit 8**. As a result of these shifts, Fannie and Freddie rapidly lost market share. In 2003, the GSEs' held a combined share of 78.4 percent of the securitization market relative to private-label issuers. By 2004, their share had fallen to just 54.1 percent, a one-year drop of more than 24 percentage points. See **Exhibit 12**. A Fannie Mae presentation in June 2005 titled "Facing Strategic Crossroads" observed that "[w]e continue to lose goals rich products to private label."[92]

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[90] In various agreements reached in 2004, 2005, and 2006, Fannie and Freddie agreed to cap their retained portfolios and increase their capital surpluses. OFHEO, "OFHEO, SEC Reach Settlement with Fannie Mae; Penalty Imposed," May 23, 2006, available at <http://www.fhfa.gov/webfiles/2204/settlementrelease52306.pdf>; OFHEO, Letter to Richard F. Syron, January 28, 2004, available at <http://www.fhfa.gov/webfiles/832/ frecapclassltr12804.pdf>; Annys Shin, "Freddie Mac Agrees to Limit Its Growth," *The Washington Post*, August 2, 2006, <http://www.washingtonpost.com/wp-dyn/content/article/2006/08/01/ AR2006080101431_pf.html>.

[91] *See, e.g.*, Jason Thomas, "Problems at Freddie Mac and Fannie Mae: Too Big to Fail?," United States Senate Republican Policy Committee, September 9, 2003; and Robert McDonald and Deborah Lucas, "An Options-Based Approach to Evaluating the Risk of Fannie Mae and Freddie Mac," *Journal of Monetary Economics*, vol. 53, no. 1 (2006), pp. 155–176.

[92] Fannie Mae Single Family Guaranty Business presentation, "Facing Strategic Crossroads," June 27, 2005 p. 16 (FHFA09775296–5341 at FHFA09775311).

As I discuss below, the loss of market share would become a significant consideration in Fannie and Freddie's later actions, including the purchase of higher risk loans and non-agency RMBS.[93]

ii. Purchases of Private-Label RMBS

66. In November 2004, HUD announced revised housing goals for the GSEs, with the stated intent "to bring the GSEs' performance to the upper end of HUD's market range estimate for each [housing] goal, consistent with the requirements of the [Federal Housing Enterprises Financial Safety and Soundness Act]."[94] The housing goals would be increased each year from 2005 through 2008, "to achieve the ultimate objective for the GSEs to lead the market" in ensuring access to mortgage credit by underserved constituencies.[95] HUD believed that the GSEs "must apply greater efforts to increasing homeownership for low- and moderate-income families, families living in underserved areas, and very-low income families and low-income families living in low-income areas."[96] HUD also expressly authorized the purchase of low- and no-documentation loans for housing-goal credit, and sought to "provide the GSEs with sufficient latitude to use their innovative capacities to determine how best to develop products to carry out their respective missions."[97]

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[93] Deposition of James Lockhart at 215-17; 224-26; 311-12; 323-24; 332 (Fannie entered Alt-A market to increase share, vis-à-vis market generally and Freddie; Board of Directors decision to increase market share pre-2007; connection between increasing market share and profitability; increasing market share as one of three reasons for investing in PLS backed by Alt-A and subprime); Deposition of Raymond Romano at 170-71 (Freddie wanted to maintain its market presence in buying PLS backed by risky low documentation loans); Deposition of Gary Kain at 165-166 (goal of increasing market share purchase of MBS).

[94] HUD's Housing Goals for the Federal National Mortgage Association (Fannie Mae) and the Federal Home Loan Mortgage Corporation (Freddie Mac) for the Years 2005–2008 and Amendments to HUD's Regulation of Fannie Mae and Freddie Mac, 69 Fed. Reg. 63,580 (November 2, 2004), at 63, 581.

[95] *Id*.

[96] *Id*.

[97] *Id*. at 63,581, 63,582.

67. The GSEs responded that the higher goals would require them to increase their purchases of subprime mortgage loans,[98] and would ultimately lead to increased purchases of subprime RMBS and related derivatives:

> Instead of directly purchasing subprime loans, securitizing them as Fannie or Freddie MBS and selling those bonds into the secondary market, Fannie and Freddie primarily purchased subprime loans through the CDO market. By purchasing investment-grade (*e.g.*, "AAA") tranches of subprime mortgage-related securities, the GSEs could continue to comply with the requirements of their charters.[99]

68. Thus, while their purchases and securitization of whole loans fell sharply in 2004 through 2006 (as discussed above), Fannie Mae and Freddie Mac were at the same time increasing their purchases of private-label subprime RMBS. From 2003 through 2006, those purchases totaled more than $593 billion, and accounted for as much as 47.9 percent of the private-label issuers' annual securitization volume. See **Exhibit 13**. By the end of 2006, the GSEs' combined holdings of private-label MBS had more than tripled, from $98.8 billion to $312.1 billion.[100] See **Exhibit 14**.

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[98] *Id*. at 63,600

[99] Richard J. Buttimer, Jr., "The financial crisis: imperfect markets and imperfect regulation," *Journal of Financial Economic Policy*, vol. 3, no. 1 (2011), pp. 21–22. See also *id*., n. 28; and *see* Memorandum from Adolfo Marzol to Dan Mudd, re Private Label Securities, March 2, 2005 (FM-COGR_00267253-56) (Fannie Mae memorandum noting that "[l]arge 2004 private label volumes were necessary to achieve challenging minority lending goals and housing goals.").

HUD officially authorized Fannie and Freddie to count private-label RMBS toward fulfillment of the housing goals in late 2005. *See* Email from Laurel Davis to Paul Norris, et al., re "Goals," October 6, 2005 (FHFA00305416–17 at FHFA00305416): "[W]e got a ruling from HUD last Friday that said we can count wraps and portfolio purchases toward housing goals (we've been waiting on this ruling since March)."

Evidence produced in this case, however, suggests that the GSEs had been counting private-label security purchases towards the housing goals even before the official HUD ruling. *See, e.g.*, Memorandum from Brian Montgomery, U.S. Department of Housing and Urban Development, to Richard Syron, Freddie Mac, November 9, 2005 (FHFA18273614-15) (contemplating a penalty because in 2004 Freddie Mac "counted, for housing goals credit, dwelling units derived from purchase of securities that HUD had not pre-approved as eligible to count as a mortgage purchase under the housing goals").

[100] The fact that the volume of the GSEs' private-label RMBS purchases during 2003 to 2006 exceeded their holdings at the end 2006 appears to be explained, at least in part, by the short expected duration of the senior

69. Fannie Mae and Freddie Mac's public disclosures explicitly acknowledged the risks associated with increased investment in subprime and other high-risk RMBS. Fannie Mae's public disclosures, for example, highlighted its willingness to accept additional risk in light of "current competitive dynamics."[101] It also explained that increased investments in RMBS were "more likely to serve the borrowers targeted by HUD's goals and subgoals," and that it would need to relax underwriting criteria to obtain "goals-qualifying" mortgage loans.[102] Such purchases, Fannie Mae cautioned, "could increase our credit losses."[103]

70. These points were echoed by Thomas Lund, a former executive vice president at Fannie Mae and its single-family chief acquisition officer, who stated before the Financial Crisis Inquiry Commission that Fannie Mae received pressure from the administration to expand its business beyond traditional fixed-rate mortgages, and that officials at Fannie Mae "did a lot of things ex-housing goals that we wouldn't have done otherwise," such as easing down payment and other credit requirements for borrowers who met certain housing goals.[104]

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tranches of RMBS purchased by the GSEs. *See, e.g.*, Deposition of Bruce Wood, November 12, 2013, 216:17–217:6: "[W]e only bought Triple A securities at that time, at least generally without any kind of exception, and the average life of those securities that we bought that were Triple A were between two and three years." A memorandum from Ray Romano to Mr. Wood and Kevin Palmer in August 2005 explained: "This average life is based on future prepayment assumptions. If we were to purchase longer assets, or if prepayments were to suddenly and dramatically slow, the spread duration on our portfolio could widen. . . . As of this memo, our MABS portfolio has a spread duration of 1.91." Freddie Mac Draft Memorandum from Ray Romano to Bruce Wood and Kevin Palmer, re "Amendment to CRCM #100, Non-Agency Mortgage ABS portfolio limit increase," August 23, 2005, p. 4 (FHFA01716940–45, at FHFA01716943).

[101] *See, e.g.*, Federal National Mortgage Association Form 10-K for the fiscal year ended December 31, 2005, pp. 38–39: "In addition, due to the current competitive dynamics of the mortgage market, we have recently increased our purchase and securitization of loans that pose a higher credit risk, such as negative-amortizing loans, interest-only loans and subprime mortgage loans. We have also increased the proportion of reduced documentation loans that we purchase or that back our Fannie Mae MBS."

[102] Federal National Mortgage Association Form 10-K for the fiscal year ended December 31, 2005, p. 25.

[103] *Id*.

[104] Memorandum for the Record, March 4, 2010, p. 2, available at <http://fcic-static.law.stanford.edu/cdn_media/fcic-docs/2010-03-04%20FCIC%20memo%20of%20staff%20interview%20with%20Thomas%20Lund,%20Fannie%20Mae.pdf> (accessed July 9, 2014). See also Deposition of Peter Niculescu, December 10, 2013, 40:20–41:3 (Fannie Mae

71. In addition to external political and regulatory pressures, GSE executives were given financial incentives to meet HUD's ever-increasing housing goals. In 2004, for example, executive compensation targets at Fannie Mae included goals related to "increasing access to affordable housing" and creating a "leading presence in the secondary mortgage market."[105] Similarly, in 2005, funding of the annual incentive pool for executives at Freddie Mac was based in part on an assessment of their performance against corporate performance objectives, including "the achievement of our affordable housing goals."[106]

72. This shift in emphasis by the GSEs, with reduced purchases of whole loans and increased purchases of private-label RMBS, was another factor in the progression of the housing bubble.

3. Lenders expanded their underwriting guidelines.

73. Also during the early 2000s, responding to a number of regulatory, economic, and competitive factors (discussed below), mortgage lenders began to expand their underwriting guidelines, issuing mortgage loans with increasingly varied loan, property, and borrower characteristics. Underwriting guidelines, which vary from originator to originator, specify the parameters or benchmarks that are generally to be followed by underwriters when issuing a mortgage loan and setting its terms. (I discuss the use and disclosure of underwriting exceptions below.) Typical benchmarks include LTV ratio, debt-to-income ratio, property type, and

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bought PLS "primarily [ ] because those securities contributed positively to the company's housing goals, which I understand it was required to meet as a matter of law).

[105] Fannie Mae, Proxy Statement, April 23, 2004, pp. 19–20.

[106] Freddie Mac, Proxy Statement, June 14, 2005, p. 29. Compliance with the housing goals continued to be a factor for both Fannie and Freddie in determining executive incentive compensation in 2006 and 2007. Fannie Mae, Proxy Statement, November 2, 2007, pp. 36–37; Fannie Mae, Proxy Statement, April 4, 2008, pp. 38–39; Freddie Mac, Proxy Statement, May 7, 2007, p. 40; and Freddie Mac, Proxy Statement, April 29, 2008, p. 43.

occupancy type, as well as credit scores. As I discuss in section C below, these changes were widely reported and tracked by industry analysts, regulators, and market participants.

74. For example, in its annual survey of credit underwriting practices, the Office of the Comptroller of the Currency ("OCC") asks its bank examiners to evaluate trends in lending standards and credit risk at large national banks. From 2003 to 2006, a generally increasing percentage of respondents reported an easing of standards in each of four types of residential mortgage loan portfolios. See **Exhibits 15A to 15D**. Banks reportedly expanded underwriting standards by, among other things, lengthening loan amortization schedules, lowering credit score guidelines, or raising limits on debt-to-income and LTV ratios.[107]

75. Industry observers also noted an increasing number of loans involving multiple "layers" of risk. *Risk layering*, as the name suggests, involves two or more loan-level characteristics that, when taken together, present a heightened risk of loss to the owner of the loan. For example, low down payments (or high LTV ratios) combined with low introductory interest rates or low or no income documentation (among many other possible combinations) could present layered risk. (The proliferation of new mortgage products, including low- and no-income documentation loans, are discussed in section 5, below.) In the first half of 2005, for example, Goldman Sachs reported that 25 percent of low-documentation loans were originated with piggyback seconds,[108] more than four times the percentage reported in 2003, while

[107] *See, e.g.*, Office of the Comptroller of the Currency, Survey of Credit Underwriting Practices, October 2006, p. 6, available at <http://www.occ.gov/publications/publications-by-type/survey-credit-underwriting-practices-report/pub-survey-cred-under-2006.pdf> (accessed July 9, 2014). Romano 272:15-273:5 ("Q: As a general matter was it your view as the vice president of credit risk oversight [at Freddie Mac] that at this time in 2005, external market practices and mortgage origination were weak? A: I would have characterized them as weaker than historical standards, yes. Q: And in 2005, those weak practices were expanding? A: The credit box of what we were willing to originate or originators that were willing to originate to were definitely expanding")

[108] "Piggyback seconds" are a type of second-lien mortgage used at purchase to reduce the borrower's down payment, typically eliminating the need for private mortgage insurance. Jack P. Friedman, et al., *Dictionary of Real Estate Terms,* 7th ed. (Hauppauge, NY: Barron's Educational Series, Inc., 2008), p. 437.

21 percent carried LTV ratios higher than 80 percent, three times the percentage reported in 2003.[109] The same analysts noted that regulators and rating agencies had expressed concern about the practice.[110]

76. Several considerations likely drove the shift in underwriting standards. Advances in data collection and analytical tools, together with low mortgage default rates observed in the aftermath of the collapse of the Internet bubble and the economic downturn following 9/11, led many lenders and investors to believe that mortgages exhibiting certain risk characteristics were not, in fact, as risky as once had been believed.[111] Continuing (and accelerating) price appreciation likewise eased default concerns and increased both lenders' willingness to extend credit to higher-risk borrowers and investors' willingness to purchase RMBS backed by such loans.[112] Some lenders were also forced to pursue a wider range of borrowers in response to governmental efforts to increase homeownership or competitive pressures to capture or retain market share.[113]

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[109] Goldman Sachs, "Housing Conference Insights: Mortgage Volume & Margin Pressure, Stable Credit," December 1, 2005, p. 14. See also Laurie Goodman, "The Changing Face of the Mortgage Market," MBA National Secondary Conference, May 22, 2007, pp. 4, 7.

[110] *Id*.

[111] Danielle DiMartino, John V. Duca, and Harvey Rosenblum, "From Complacency to Crisis: Financial Risk Taking in the Early 21st Century," *Economic Letter: Insights from the Federal Reserve Bank of Dallas*, vol. 2, no. 12 (December 2007), pp. 1–4.

[112] Jan K. Brueckner, Paul S. Calem, and Leonard I. Nakamura, "Subprime mortgages and the housing bubble," *Journal of Urban Economics*, vol. 71, no. 2 (2012), pp. 230–243 at 230–231; Danielle DiMartino, John V. Duca, and Harvey Rosenblum, "From Complacency to Crisis: Financial Risk Taking in the Early 21st Century," *Economic Letter: Insights from the Federal Reserve Bank of Dallas*, vol. 2, no. 12 (December 2007), pp. 1–4; Christopher L. Foote, Kristopher S. Gerardi, and Paul S. Willen, "Why Did So Many People Make So Many *Ex Post* Bad Decisions? The Causes of the Foreclosure Crisis," Federal Reserve Bank of Boston, no. 12-2 (July 20, 2012), p. 18.

[113] *See* discussion *supra*, § VII.B.2. *See also, e.g.*, Ruth Simon, "Mortgage Lenders Loosen Standards — Despite Growing Concerns, Banks Keep Relaxing Credit-Score, Income, and Debt-Load Rules," *The Wall Street Journal*, July 26, 2005.

4. Subprime lending expanded.

77. Related to the expansion of underwriting guidelines was the significant growth of what is generally referred to as the *subprime* market. Though the term is widely used, no uniform standard exists to define the loans or borrowers included in the subprime market. Broadly, however, subprime refers to loans made to borrowers with poor credit histories and, therefore, a higher risk of default than more-creditworthy "prime" borrowers..[114]

78. Subprime lending dates to at least the early 1980s, with the passage by Congress of two key laws: the Depository Institutions Deregulation and Monetary Control Act of 1980 and the Alternative Mortgage Transaction Parity Act of 1982. The former permitted lenders to charge higher rates and fees while the latter permitted variable interest rates and balloon payments.[115] The changes allowed lenders to recapture the costs associated with higher-risk lending. As a result, subprime loans became a larger part of many lenders' mortgage origination activity.

79. While statistics necessarily depend upon one's definition of *subprime*, the volume of subprime lending increased dramatically in the early 2000s regardless of definition. One industry source estimates that subprime lending grew more than six-fold in just five years, from an estimated $100 billion in 2000 to $625 billion in 2005. See **Exhibit 16**. From 2003 to 2005

[114] Much of the data for the exhibits cited in this section derive from Inside Mortgage Finance, a publisher of news and data related to the residential mortgage business. See Inside Mortgage Finance, "About Us," <http://www.insidemortgagefinance.com/about/> (accessed July 9, 2014). I understand that the data are compiled from surveys of mortgage lenders and other industry sources, whose definitions may vary. The publisher states only that subprime loans "are tied to borrowers' credit ratings, expressed as letter grades, such as A–, B, D." Inside Mortgage Finance, The 2012 Mortgage Market Statistical Annual CD-ROM, Glossary.

For a further discussion of the use of this term, *see, e.g.*, Yuliya Demyanyk and Otto Van Hemert, "Understanding the Subprime Mortgage Crisis," *The Review of Financial Studies*, vol. 24, no. 6 (2011), p. 1853; and Standard & Poor's, "U.S. Residential Subprime Mortgage Criteria," 1999, pp. 11–12.

[115] Souphala Chomsisengphet and Anthony Pennington-Cross, "The Evolution of the Subprime Mortgage Market," *Federal Reserve Bank of St. Louis Review,* vol. 88, no. 1 (January/February 2006), p. 38.

alone, the number of such loans nearly doubled, from 1.1 million to 1.9 million.[116] By dollar volume, subprime loans as a percentage of all new mortgage loans grew from 9.5 percent in 2000 to 20 percent in 2005. See **Exhibit 17**. The growth of the subprime market, enabled in part by the loosening of lending standards associated with the GSEs' pursuit of the housing goals, contributed to increased demand for homes and mortgages by expanding the number of eligible borrowers.

5. Non-traditional mortgage products proliferated.

80. Beginning in the early 2000s, lenders increased their offerings of non-traditional mortgage products, such as adjustable-rate loans, interest-only loans, "pay-option" loans, and low- or no-documentation loans. I also include in this category loans made for purposes other than the purchase of a home, such as home equity lines of credit (or "HELOC") and Closed-End Second Liens ("CESL").[117]

81. *Non-traditional* is not synonymous with *subprime*. While non-traditional loans may carry a higher default risk than conventional loans, and while some non-traditional loan products may appeal to borrowers with impaired credit, the nature of the risks associated with non-traditional products is generally distinct from those associated with a borrower's creditworthiness alone.

82. Non-traditional mortgage products provided consumers with a wider range of financing options and enabled mortgage lenders to better match their product offerings with the

[116] Christopher Mayer, Karen Pence, and Shane M. Sherlund, "The Rise in Mortgage Defaults," *Journal of Economic Perspectives*, vol. 23, no. 1 (Winter 2009), p. 29, Table 1.

[117] A HELOC creates an account secured by the value of the home against which the homeowner can borrow on demand. Closed-end second liens refers to home equity loans with a fixed original principal in a second-lien position. Jack P. Friedman, et al., *Dictionary of Real Estate Terms*, 7th ed. (Hauppauge, NY: Barron's Educational Series, Inc., 2008), pp. 86, 230, 437–438. I include home equity loans among non-traditional mortgage products based on their subordinate position relative to traditional first mortgages.

risk profiles, expected cash flows, and affordability criteria of borrowers. Such products appealed to two distinct types of borrowers: those with adequate credit but atypical borrowing needs or constraints, and those with impaired credit who could not qualify for traditional loans. Low- and no-documentation loans, for example, could be attractive to borrowers with difficult-to-document income or assets (such as the self-employed) who were willing to pay a premium to shorten and simplify the loan application process. To borrowers with short expected investment horizons (or a short expected stay in their current home), the low initial rates of adjustable-rate mortgages may have been appealing.[118] HELOC appealed to homeowners with intermittent credit needs (such as for educational expenses or home renovation),[119] who benefitted from generally lower interest rates and more favorable tax treatment than other forms of consumer credit. CESLs provided borrowers with similar benefits but required them to receive the entire loan amount upfront.

83. From 2000 to 2006, growth in the origination of non-traditional mortgage-loan types outpaced traditional mortgages. Alt-A mortgages, which had comprised less than two percent of the market for much of the 1990s, grew to 13.4 percent of the market in 2006. Home-equity loans grew from just over five percent of all loan originations in 2000 to more than 14 percent in both 2006 and 2007. Meanwhile, conventional/conforming mortgage loans fell to just one-third of the market by 2006, from historical norms of approximately 50 to 60 percent. See **Exhibit 17**.[120]

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[118] *See, e.g.*, Michael Fratantoni, et al., "Housing and Mortgage Markets: An Analysis," Mortgage Bankers Association, September 6, 2005, pp. 7, 47–48, 50.

[119] Jack Guttentag, *The Mortgage Encyclopedia*, 2nd ed. (New York: McGraw-Hill, 2010), p. 90.

[120] *See also, e.g.*, Kristopher Gerardi, et al., "Making Sense of the Subprime Crisis," Federal Reserve Bank of Atlanta Working Paper 2009-2 (February 2009), p. 10.

84. Similarly, adjustable-rate mortgages ("ARMs"), which traditionally have grown in popularity during rising rate environments, hovered between 20 and 30 percent of the market through much of the 1990s and early 2000s. In 2004, the popularity of ARMs nearly doubled, reaching more than 50 percent of the market. Elevated levels continued through 2006. See **Exhibit 18**. Curiously, the percentage of ARMs grew even as interest rates on 30-year fixed-rate mortgages remained relatively low by historical standards. See **Exhibit 18**. The sudden growth in popularity in a relatively stable rate environment suggests an increased reliance on the low initial rates offered by ARMs (coupled with expectations of continued home-price appreciation) to enhance the affordability of homes. Some have also theorized that the growth in popularity of ARMs during this period may have been attributable in part to an increase in borrowers with short investment horizons (or short expected tenancy in their homes), and therefore a need for a shorter period of interest-rate protection.[121]

85. Finally, the GSEs' demand for housing-goals-compliant loans and mortgage-related securities also contributed to the proliferation of non-traditional mortgage products. As discussed in section 2, above, beginning in 2004 the GSEs cut their purchases and securitization of whole loans and increased their purchases of private-label RMBS. See **Exhibits 8 and 14**. Partly in response to the GSEs, private-label issuers increased their purchases and securitization of Alt-A and subprime loans (as well as second mortgages), which grew from a total of $289 billion in 2003 to $889 billion in 2006. See **Exhibit 19**. As agency (and non-agency)

[121] *See, e.g.*, Michael Fratantoni, et al., "Housing and Mortgage Markets: An Analysis," Mortgage Bankers Association, September 6, 2005, p. 50–51. I discuss consumer expectations of home prices at fn. 209, *infra*.

purchases of subprime and other non-prime RMBS increased, lenders' incentive to originate such loans increased.[122]

6. The policies of the Federal Reserve, together with capital inflows from abroad, led to historically low interest rates.

86. Each of the factors described above had the effect of stimulating demand by increasing the availability of loans, lowering the initial cost of homeownership, or reducing homeowners' monthly cash outflows. Certain market factors served to reinforce these effects, notably including a period of historically low mortgage interest rates, driven by actions of the Federal Reserve and capital inflows from foreign investors.

(a) The Federal Reserve Board lowered the federal funds rate.

87. Following the collapse of the Internet bubble in 2000 and the terrorist attacks of 9/11, and with growing concern about the possibility of deflation, the Federal Open Market Committee of the Federal Reserve set progressively lower targets for the federal funds rate.[123] The low funds rate contributed downward pressure on already low mortgage rates, driving the rate on traditional 30-year fixed-rate mortgages to historic lows.[124] See **Exhibit 20A**. Low

[122] For a more detailed discussion of the financial regulation of the GSEs and its effect on the mortgage market, see Richard J. Buttimer, Jr., "The financial crisis: imperfect markets and imperfect regulation," *Journal of Financial Economic Policy*, vol. 3, no. 1 (2011), pp. 17–22.

[123] The federal funds rate is a baseline interest rate that influences most lending activity, including mortgage lending. See Board of Governors of the Federal Reserve System, Federal Open Market Committee, "About the FOMC," <http://www.federalreserve.gov/monetarypolicy/fomc.htm> (accessed July 9, 2014). *See* Janet L. Yellen, "A View of the Economic Crisis and the Federal Reserve's Response," FRBSF Economic Letter 2009-22, July 6, 2009, pp. 1–2.

[124] Former Fed Chairman Greenspan, however, argues that 30-year mortgage rates "delinked" from the federal funds rate from 2002 to 2005, and that, "as a consequence, the funds rate exhibited little, if any, influence on home prices." Alan Greenspan, "The Crisis," Greenspan Associates LLC, April 15, 2010, p. 40. Indeed, the correlation between the two rates from 2002 to 2005 fell to a relatively low 0.15. Overall, however, from 1990 through June 2013, the correlation was strong and positive, at 0.86. In fact, the Fed's own website asserts a relationship between the funds rate and other short- and long-term interest rates: "Changes in the federal funds rate trigger a chain of events that affect other short-term interest rates, foreign exchange rates, long-term interest rates, the amount of money and credit, and, ultimately, a range of economic variables, including employment, output, and prices of

mortgage rates reduce the cost of borrowing, making homes more affordable and further expanding the number of eligible borrowers.[125]

88. Low federal funds rate targets represented a departure from prior policy. Stanford economist John Taylor estimates that from 2002 to 2006 the Fed set the target for the federal funds rate as much as three percentage points lower than previous policy would have suggested. Taylor argues that "this extra-easy policy accelerated the housing boom and thereby ultimately led to the housing bust."[126] While myriad factors contributed to the housing boom (and precipitated the bust), as this report demonstrates, Fed policy clearly played a role.

(b) International capital inflows depressed mortgage rates.

89. Increased foreign investment in U.S. securities added further downward pressure on interest rates.[127] Asian holdings in particular grew dramatically. The Asian debt crisis of 1997–'98 inspired a "flight to quality" among Asian investors, who subsequently sought low-risk instruments like U.S. Treasuries.[128] China, for example, reportedly increased its total holdings of U.S. Treasury securities and agency paper (bonds issued by governmental agencies) from

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goods and services." Board of Governors of the Federal Reserve System, Federal Open Market Committee, "About the FOMC," <http://www.federalreserve.gov/ monetarypolicy/fomc.htm> (accessed July 9, 2014).

[125] The sharp decline in mortgage rates also led many borrowers to refinance existing mortgages. *See* **Exhibit 21.**

[126] John B. Taylor, *Getting Off Track: How Government Actions and Interventions Caused, Prolonged, and Worsened the Financial Crisis* (Stanford, CA: Hoover Institution Press, 2009), pp. 2–4.

[127] *See, e.g.*, Janet L. Yellen, "A View of the Economic Crisis and the Federal Reserve's Response," FRBSF Economic Letter 2009-22, July 6, 2009, p. 1.

[128] *See, e.g.*, Vivek Arora and Martin Cerisola, "How Does U.S. Monetary Policy Influence Sovereign Spreads in Emerging Markets?," *IMF Staff Papers*, vol. 48, no. 3 (2001), p. 477.

$181 billion in June 2002 to $1.2 trillion in June 2008.[129] The share of all U.S. Treasuries held by Asian investors grew from 15 percent in 2000 to 32 percent in 2006.[130]

90. Former Chairman Greenspan argued that an influx of capital to U.S. markets may also have stemmed from the fall of the Berlin Wall in late 1989. Hundreds of millions of workers from former Soviet bloc countries entered the global marketplace, accelerating the pace of global economic expansion. The resulting excess demand for savings, he asserted, drove down long-term interest rates, and "[a]sset prices, particularly house prices, accordingly moved dramatically higher."[131]

91. Commensurate with the increase in foreign investor holdings of U.S. Treasuries, foreign investor holdings of mortgage-related securities increased each year from 2003 to 2006. See **Exhibit 22**. The increased demand for mortgage securities (and therefore the underlying mortgages) provided liquidity to the market, adding further downward pressure on mortgage rates and contributing to the boom in the mortgage and financial markets.[132] Foreign investment in U.S. debt securities may have kept mortgage rates as much as one percentage point lower than would otherwise have been expected.[133]

92. These developments have been characterized as a "global savings glut," in which emerging market economies with large current account surpluses boosted their purchases of U.S.

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[129] Wayne M. Morrison and Marc Labonte, "China's Holdings of U.S. Securities: Implications for the U.S. Economy," CRS Report for Congress, July 30, 2009, pp. 3–4.

[130] Ashok Bardhan and Dwight Jaffee, "The Impact of Global Capital Flows and Foreign Financing on U.S. Mortgage and Treasury Interest Rates," The Research Institute for Housing America of the Mortgage Bankers Association, June 12, 2007, pp. 8–9.

[131] Alan Greenspan, "The Crisis," Greenspan Associates LLC, April 15, 2010, pp. 3–5.

[132] For a discussion of these trends, *see, e.g.*, Markus K. Brunnermeier, "Deciphering the Liquidity and Credit Crunch 2007–2008," *Journal of Economic Perspectives*, vol. 23, no. 1 (Winter 2009), pp. 77–100.

[133] Ashok Bardhan, "The Yin and Yang of US Debt," *Yale Global Online*, April 4, 2008.

fixed income securities.[134] Whether the cause can be attributed to Fed policy or foreign investment, the effect of the lowered mortgage rates on the mortgage and housing industries was profound. One study attributes approximately 20 percent of the rise in U.S. home prices between 1996 and 2006 to the effect of lower real interest rates.[135]

7. Low interest rates combined with low unemployment to spur consumer confidence.

93. The Fed's actions in the early 2000s worked as intended, and were followed by a period of economic expansion. In 2002, the U.S. economy pulled out of a brief recession, and grew at an average annual rate of approximately three percent through 2007. See **Exhibit 23**. Meanwhile, unemployment fell from a near-term peak of 6.3 percent in June 2003 to 4.4 percent in May 2007. See **Exhibit 24**.

94. With an improving economy, consumers grew increasingly optimistic. The Consumer Confidence Index, a barometer of consumer perceptions of the health of the U.S. economy, improved from a low of 68 in March 2003, following the early 2000s recession, to 110 in February 2007. See **Exhibit 25**.

95. Low unemployment, high consumer confidence, and appreciating home prices translated into a willingness on the part of consumers to spend.[136] Two key indicators, personal consumption expenditures and durable goods orders, both exhibited strong growth between 2003

[134] Ben S. Bernanke, "The Global Saving Glut and the U.S. Current Account Deficit," Remarks at the Sandridge Lecture, Virginia Association of Economists, Richmond Virginia, March 10, 2005 <www.federalreserve.gov/boarddocs/speeches/2005/200503102/> (accessed July 9, 2014).

[135] Edward Glaeser, Joshua Gottlieb and Joseph Gyourko, "Can Cheap Credit Explain the Housing Boom," National Bureau of Economic Research, Working Paper 16230 (July 2010).

[136] The "wealth effects" of homeownership are described in detail in Eric S. Belsky, "Housing Wealth Effects and the Course of the US Economy: Theory, Evidence, and Policy Implications," in S.J. Smith and B.A. Searle, eds., *The Blackwell Companion to the Economics of Housing: The Housing Wealth of Nations* (Oxford, UK: Wiley-Blackwell, 2010).

and 2007. See **Exhibit 26**. One can also infer the tendency of consumers to spend by measuring their tendency to save. In the early 1990s, the consumer savings rate ranged from approximately 7 to 10 percent of income; by 2005, that rate had fallen as low as 2 percent. See **Exhibit 27**.

96. Not surprisingly, consumers also exhibited a greater willingness to take on mortgage debt. See **Exhibit 4**. Among other things, the sharp decline in mortgage interest rates led many borrowers to refinance existing mortgages, often "cashing out" some or all of the accumulated equity in their homes. Freddie Mac estimates that homeowners cashed out approximately $823 billion in home equity between 2005 and 2007. See **Exhibit 28**. Consumers' ability to extract home equity during this period was an important contributor to robust consumer spending and heightened consumer confidence.[137]

8. Increased investor activity in the housing market also contributed to increased housing demand and home price appreciation.

97. Another factor that contributed to increased housing demand and home price appreciation during this period was the growing role of investors in the housing market, including buyers hoping to resell their homes quickly at a profit, as well as those purchasing second homes or vacation homes.[138] The percentage of first-lien mortgages used for the purpose of purchasing non-owner-occupied, one- to four-family homes increased from 7.8 percent in 1998 to 16.3 percent in 2005. See **Exhibit 29**. Several authors have found that the increased activity of investors contributed to the overall rise in home prices during this period.[139]

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[137] For further discussion of the uses of home equity withdrawal, *see, e.g.*, Vladimir Klyuev and Paul Mills, "Is Housing Wealth an ATM? The Relationship Between Household Wealth, Home Equity Withdrawal, and Savings Rates," International Monetary Fund, IMF Working Paper WP/06/162 (June 2006).

[138] Such homes are referred to collectively as *non-owner occupied homes*.

[139] *See, e.g.*, William C. Wheaton and Gleb Nechayev, "The 1998–2005 Housing 'Bubble' and the Current 'Correction': What's Different This Time?," *Journal of Real Estate Research*, vol. 30, no. 1 (2008), pp. 1–26; and

9. The attractive yields and low apparent risk of mortgage-backed securities drew investors to the mortgage securitization market, driving demand and providing additional liquidity to lenders.

98. Buoyed by favorable macroeconomic conditions, as well as the steady increase in home prices, securities investors (to be contrasted with the real estate investors mentioned in the preceding section) increasingly regarded RMBS as high-value, low-risk investments. Higher investor demand drove growth in the securitization market. See **Exhibit 8**.

99. A breakdown of year-over-year changes in RMBS holdings across several categories of investors indicates that demand was widespread. From 2003 through 2007, depository banks, foreign investors, mutual funds, and life insurers all generally increased their holdings of mortgage-related investments. See **Exhibit 22**.[140]

100. The securitization of mortgage loans facilitated the growth of the residential mortgage market. As former Chairman Greenspan observed in 2005:

> By reducing the risk of making long-term, fixed-rate loans and ensuring liquidity for mortgage lenders, the [securitization] market helped stimulate widespread competition in the mortgage business. The mortgage-backed security helped create a national and even an international market for mortgages, and market support for a wider variety of home mortgage loan products became commonplace.[141]

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Breck Robinson and Richard Todd, "The Role of Non-Owner-Occupied Homes in the Current Housing and Foreclosure Cycle," Federal Reserve Bank of Richmond, Working Paper 10-11 (May 2010).

[140] **Exhibit 22** indicates that the GSEs' combined holdings of mortgage-related securities (including both agency and non-agency RMBS) declined in 2005, 2006 and 2007, before increasing again beginning in 2008. As I discuss in footnote 100 above, the decline was due at least in part to the short expected duration of the senior tranches of RMBS purchased by the GSEs, and occurred despite the GSEs' increased purchases of private-label subprime RMBS that began in 2004.

[141] Alan Greenspan, "Consumer Finance," Remarks at the Federal Reserve System's Fourth Annual Community Affairs Research Conference, Washington, D.C., April 8, 2005. *See also* Richard J. Rosen, "The Role of Securitization in Mortgage Lending," *Chicago Fed Letter*, no. 244 (November 2007).

101. In sum, the factors that contributed to the steady increase in home prices from 2000 to 2006 were numerous and varied. These factors included governmental policies designed to promote homeownership and encourage banks to expand lending programs, increased foreign investment, low interest rates, and a sustained period of economic growth. These factors combined to drive significant increases in consumer demand for both homes and mortgages and ultimately led to an unprecedented increase in home prices.

C. Changes in the Market Were Closely Tracked

102. The changes I have described above — the evolution of governmental policies regarding homeownership, lenders' expansion of underwriting guidelines, the growth and development of the subprime and securitization markets, and the proliferation of mortgage products — were widely reported in public sources and closely tracked by regulators, industry organizations, market analysts, and academic researchers.

103. Each year, for example, the Mortgage Bankers Association (a national association representing originators, servicers, and underwriters) produced reports discussing such issues as subprime originations, delinquencies and foreclosures, securitizations, and macroeconomic factors affecting the mortgage market.[142] Ratings agencies and industry analysts produced reports covering the performance and evaluation of RMBS, including the effects of changes in underwriting standards, expansion of the subprime market, and the proliferation of mortgage

[142] *See, e.g.*, Mortgage Bankers Association, "MBA Releases New 2003 Subprime Mortgage Lenders," October 11, 2004, <WNN.nilaa.org/NEM8811dMedia/PressCeniBr/29742.htm> (accessed July 9, 2014); Mortgage Bankers Association, "Residential Mortgage Delinquencies and Foreclosure Inventory Down From Last Year, According to MBA National Delinquency Survey," September 8, 2004, <WNN.nilaa.org/NEM8811dMedia/PressCfrtBr/'l!J7'Zl.htm> (accessed July 9, 2014); Mortgage Bankers Association, "MBA Releases 2003 Originations by Purchaser Type," October 13, 2004, <WNN.nilaa.org/NEM8811dMedia/PressCeniBr/29745.htm> (accessed July 9, 2014); and Doug Duncan and Orawin Velz, "A Modest Slowdown Ahead," *Mortgage Banking* (January 2006), pp. 27–31.

products.[143] Investment bankers tracked changes in numerous collateral characteristics underlying RMBS.[144] The data to discern these and other mortgage-related trends were readily available from sources such as Bloomberg, Loan Performance, and the Mortgage Bankers Association.

104. In September 2006, even as the direction of the housing market grew increasingly uncertain (a development I discuss more fully below), banking regulators — including the OCC, the Fed, the FDIC, the OTS, and the National Credit Union Administration — observed publicly that mortgage loans had been "offered by more lenders to a wider spectrum of borrowers who may not otherwise qualify for more traditional mortgage loans . . . ."[145] They also observed an increased incidence of risk layering. Still, their guidance did not suggest that institutions should withdraw non-traditional mortgage products or halt the practice of risk layering; rather, the agencies advised that loan terms and underwriting standards should remain consistent with prudent lending practices: "Institutions with sound underwriting, adequate risk management, and acceptable portfolio performance will not be subject to criticism merely for offering such products."[146]

105. Implicit in the regulators' comments is the understanding that looser guidelines are not synonymous with "sloppier" underwriting. The expansion was a foreseeable response to a changing market, enabled by real and perceived improvements in risk management and

[143] *See, e.g.*, Wachovia Securities, "Lenders Facing More Regulatory Scrutiny?," September 29, 2004; UBS, Mortgage Strategist, "Highlights and Recommendations," December 14, 2004, p. 1; and Standard & Poor's, "Structured Finance: U.S. Residential Subprime Mortgage Criteria," 1999.

[144] *See, e.g.*, Laurie Goodman, "The Changing Face of the Mortgage Market," MBA National Secondary Conference, May 22, 2007, p. 4; and Goldman Sachs, "A Primer on the Sub-Prime Market," February 2006, p. 5.

[145] Interagency Guidance on Non-traditional Mortgage Product Risks, 71 Fed. Reg. 58,609 (October 4, 2006).

[146] *Id*.

assessment, and prompted by regulatory incentives and mandates.[147] As former Chairman Greenspan noted — among numerous other commentators — developments in information technology, risk assessment, and market dynamics "induced banks to change their policies from simply not making riskier mortgage loans to making such credit available but charging for the additional risk taken."[148] He emphasized that market participants were compensated for the increased risk: "Banks are now making many more such loans to higher-risk borrowers, and they justifiably seek compensation for the higher risk through higher interest rates."[149]

106. In fact, achieving expanded homeownership goals required regulators, including the Fed, to permit the expansion of lending to subprime borrowers. As one observer explained, "[t]he Fed was not inclined to undermine gains in minority and low-income home ownership by placing a regulatory brake on subprime mortgage originations."[150]

107. Just as looser guidelines should not be equated with sloppy underwriting, neither should the use of underwriting exceptions. Federal guidelines in fact encourage lenders to

[147] For discussions of the expansion of technology in the underwriting process, *see, e.g.*, Michael Fratantoni, et al., "Housing and Mortgage Markets: An Analysis," Mortgage Bankers Association, September 6, 2005, pp. 72–73; Kenneth Temkin, Jennifer E.H. Johnson, and Diane Levy, "Subprime Markets, the Role of GSEs, and Risk-Based Pricing," The Urban Institute, March 2002, pp. 36–45.

[148] Alan Greenspan, "Bank Regulation," Remarks before the Independent Community Bankers of America National Convention, San Antonio, TX, March 11, 2005.

[149] *Id*. That is not to say that on an *ex post* basis we might not conclude that the risks associated with certain disclosed loan characteristics were underpriced. Mr. Lund, for example, indicated to the Financial Crisis Inquiry Commission that "Fannie Mae mispriced the risk of expanding into riskier products to meet housing goals." Memorandum for the Record, March 4, 2010, p. 3, available at <http://fcic-static.law.stanford.edu/cdn_media/fcic-docs/2010-03-04%20FCIC%20memo%20of%20staff%20interview%20with%20Thomas%20Lund,%20Fannie%20Mae.pdf> (accessed July 9, 2014).

[150] J. Kevin Corder, "The Federal Reserve System and the Credit Crisis," *Public Administration Review*, vol. 69, no. 4 (July/August 2009), p. 624.

consider requests from borrowers whose credit needs or circumstances fall outside published underwriting guidelines, when other compensating factors support the underwriting decision.[151]

108. Finally, the use of underwriting exceptions was explicitly disclosed to participants in the mortgage securitization market. For each of the seven At-Issue Securities, Nomura disclosed in the Prospectus Supplements that exceptions to the underwriting standards described in the Prospectus Supplements could be made and were likely made for some portion of the loans backing the securitizations. The Prospectus Supplements for NAA 2005-AR6, NHELI 2006-HE3, NHELI 2006-FM2, NHELI 2007-1, and NHELI 2007-3 disclosed that "certain exceptions to the underwriting standards described in this prospectus supplement are made in the event that compensating factors are demonstrated by a prospective borrower." See **Exhibit 30**.

VIII. THE DECLINE IN THE HOUSING MARKET AND ITS IMPACT ON THE MORTGAGE INDUSTRY

A. Contraction of the Housing Market, the Decline in Home Prices, and the Effect on the Broader Economy

109. In early 2006, the steady increase in U.S. home prices stalled. Despite a growing economy and continued growth of the secondary mortgage market, uncertainty in the housing market set in. For 13 months, following a peak in April 2006, the Case-Shiller 10-City Composite and the FHFA House Price Index, two of the most widely watched home price

[151] *See* Federal Deposit Insurance Corporation, Appendix A to Subpart A of Part 365 — Interagency Guidelines for Real Estate Lending Policies, <http://www.fdic.gov/regulations/laws/rules/2000-8700.html> (accessed July 9, 2014). The regulations have been in effect since at least March 1993.

See also U.S. Department of Housing and Urban Development, HUD 4155.1, Mortgage Credit Analysis for Mortgage Insurance, § 4.F.3.a. Compensating factors may include a higher interest rate or fees to compensate the lender for the increased risk. Other factors may include the size of the down payment, the borrower's accumulated savings or cash reserves, other deposits or a prior relationship with the lender, a demonstrated ability to pay housing expenses greater than or equal to the proposed monthly payments, or potential for increased earnings in the future. *Id*., § 4.F.3.b.

indices in the U.S., fluctuated, offering often contradictory data on the direction of home prices and spurring uncertainty in the market. See **Exhibit 31**.

110. In May 2007, both indexes headed sharply downward.[152] In one 26-month period, from April 2007 through May 2009, home prices in the U.S. fell by nearly a third.[153] The Case-Shiller 10-city Composite index fell each month during that period. In all, prices that had fallen only once on a year-over-year basis since the end of World War II would fall in six consecutive years, from 2006 through 2011.[154] See **Exhibit 32**. As the housing decline progressed, losses and write-downs occurred across the entire financial sector. Globally, financial institutions attributed an estimated $2.1 trillion of losses and write-downs to the mortgage market decline and subsequent turmoil in the financial markets.[155]

111. The ensuing recession lasted one and a half years, from December 2007 to June 2009, making it the longest recession since the Great Depression of the 1930s.[156] Over the course of the recession, real gross domestic product ("GDP"), a broad and commonly used measure of economic activity, contracted by approximately 4.3 percent, including a 2.2 percent drop in the

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[152] In some cities, the decline began even earlier. In Phoenix, San Diego, and Detroit, for example, home prices began to fall as early as April 2006, and experienced only one monthly increase from that point through May 2009. See S&P/Case-Shiller Home Price Indices, available at <http://www.spindices.com/index-family/real-estate/sp-case-shiller> (accessed July 9, 2014).

[153] *See* S&P/Case-Shiller Home Price Indices (Composite-10), available at <http://www.spindices.com/index-family/real-estate/sp-case-shiller> (accessed July 9, 2014).

[154] Based on data compiled by Robert J. Shiller, available at <http://irrationalexuberance.com/> (accessed July 9, 2014), as shown at **Exhibit 2**. Other indices, such as the OFHEO purchase-only index, may lead to somewhat different conclusions. Regardless, the home price decline observed from 2006–2011 was the longest and deepest decline since World War II.

[155] Bloomberg Write Downs and Credit Losses Index (Ticker:WDCI). The WDCI tracked the write downs and losses related to the financial crisis at 110 of the largest financial institutions globally. See Yalman Onaran, "Counting Writedowns Replaces Deals Won as Wall Street's Ritual," Bloomberg, September 1, 2008 <http://www.bloomberg.com/apps/news?pid=newsarchive&sid=azgIxINbnuhU&refer=bondheads> (accessed July 9, 2014).

[156] The National Bureau of Economic Research, US Business Cycle Expansions and Contractions, <http://nber.org/cycles/cyclesmain.html> (accessed July 9, 2014).

fourth quarter of 2008 alone. See **Exhibit 23**. With the economic contraction came significant job losses. By the fourth quarter of 2009, unemployment in the U.S. had more than doubled, from 4.4 percent in May 2007 to 10.0 percent, representing a net loss of more than 7 million jobs.[157] See **Exhibit 24**. Job losses contributed both to falling demand in the housing and mortgage markets and to an increased incidence of delinquency and default by mortgage borrowers, which only served to reinforce the downward spiral.

112. Warren Buffett offered this description of the contagion that brought down the U.S. economy in a letter to his shareholders:

> By the fourth quarter [of 2008], the credit crisis, coupled with tumbling home and stock prices, had produced a paralyzing fear that engulfed the country. A freefall in business activity ensued, accelerating at a pace that I have never before witnessed. The U.S. — and much of the world — became trapped in a vicious negative-feedback cycle. Fear led to business contraction, and that in turn led to even greater fear.[158]

B. Factors Contributing to the Contraction of the Housing Market and the Decline in Home Prices

113. The factors contributing to the contraction of the housing market and the decline in home prices were numerous and mutually reinforcing: Higher prices and higher interest rates led to a softening of demand for homes; falling demand, coupled with an overhang of supply, put downward pressure on home prices; falling prices led to negative equity, which together with newly tighter underwriting standards limited the ability of homeowners to refinance existing loans. As the economy soured and unemployment soared, defaults and foreclosures increased; with the increase in defaults, investor demand for securitized mortgages collapsed.

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[157] The number of unemployed persons in the civilian labor force averaged 7.1 million in 2007 and 14.3 million in 2009. U.S. Bureau of Labor Statistics, Labor Force Statistics from the Current Population Survey, available at <http://www.bls.gov/web/empsit/cpseea01.htm> (accessed July 9, 2014).

[158] Berkshire Hathaway, Inc., 2008 Annual Report, p. 3.

114. I discuss each of these factors in the sections that follow.

1. Home prices moved out of reach for many households.

115. Even with the proliferation of non-traditional mortgage products, an unavoidable consequence of the dramatic rise in home prices was that some potential buyers would be left behind. In mid-2006, the Housing Affordability Index, a measure of the relationship between home prices and median household income, reached its lowest level in at least 16 years. See **Exhibit 33**. The prior trough, in 1990, coincided with the only other year-over-year decline in U.S. home prices since World War II.[159]

116. First-time homebuyers were hardest hit. The First-Time Homebuyer Affordability Index, which measures the percentage of all U.S. households that can afford an entry-level home, fell 19 points from early 2004 through mid-2006, suggesting that the very buyers who had been the focus of governmental policy and lender efforts to increase homeownership were being driven from the market by the sharp increase in prices.[160]

2. Actions of the Federal Reserve led to higher mortgage loan rates, further reducing the affordability of homes.

117. Beginning in mid-2004, following gains in GDP growth and employment and in an effort to stave off a perceived threat of inflation, the Fed began steadily increasing the targeted federal funds rate from its historically low rate of one percent.[161] By mid-2006, the

[159] *See supra*, fn. 154.

[160] *See* National Association of Realtors, First-Time Homebuyer Affordability for the United States 1989–current. Both the Housing Affordability Index and the First-Time Homebuyer Affordability Index fail to consider the effect of new mortgage products or changes in lending standards on housing affordability.

[161] The Federal Reserve Board, Minutes of the Federal Open Market Committee, June 29–30, 2004, <http://www.federalreserve.gov/fomc/minutes/20040630.htm> (accessed July 9, 2014): "Recent developments, notably the persistence of solid gains in output and employment along with indications of some increase in inflation, were seen as warranting a first step in the process of removing policy accommodation."

federal funds rate had reached 5.25 percent, its highest level in more than five years. See **Exhibit 20A**. The Fed's actions put upward pressure on mortgage rates; the rate on conventional 30-year mortgages, which had fallen as low as 5.23 percent in mid-2003 (and stayed below 6.0 percent through most of 2004 and 2005), climbed to 6.76 percent by mid-2006. See **Exhibit 20B**. All else equal, higher mortgage rates increase the cost of borrowing, making homes less affordable.[162]

118. Indeed, over the period 1990 to 2005, home prices in the United States were negatively correlated (–0.725) with mortgage rates — as mortgage rates decreased, home prices increased. See **Exhibit 34**. This inverse relationship between interest rates and home prices has been confirmed in a number of studies involving larger datasets and longer time series, as well as other housing markets.[163]

3. In certain markets, the rapid construction of new homes created an excess of supply over demand.

119. Not surprisingly, as demand for homes increased in the late 1990s and early 2000s, the home-building industry had responded by accelerating new-home construction. Annualized housing starts in the U.S., having hovered in the range of approximately 1.0 to 1.4 million starts from 1999 to 2002, accelerated in 2003, reaching a peak of more than 1.8 million starts in January 2006. See **Exhibit 35**. By the end of the boom, however, new-home

[162] Assuming a front-end ratio of 28 percent, a 1.5 percent increase in the rate on a 30-year fixed rate mortgage securing a $250,000 loan would increase the monthly payment by approximately $240, and increase the qualifying monthly income by more than $850, or more than $10,000 annually. (The *front-end ratio*, total monthly loan payments divided by qualifying monthly income, is one measure lenders use in assessing the risk that a given borrower will default. Most lenders establish a minimum front-end ratio, or *qualifying ratio*, for use in evaluating loan applications. Jack P. Friedman, et al., *Dictionary of Real Estate Terms,* 7th ed. (Hauppauge, NY: Barron's Educational Series, Inc., 2008), pp. 205, 392.)

[163] *See, e.g.*, Marco Terrones and Christopher Otrok, "The Global House Price Boom," in *World Economic Outlook: The Global Demographic Transition* (Washington, D.C.: International Monetary Fund, September 2004), pp. 71–89, at p. 78.

construction had outpaced demand. From the third quarter of 2004 to the first quarter of 2007, the national vacancy rate for single-family homes — the percentage of homes for sale that are unoccupied — grew from 1.7 percent to 2.8 percent, suggesting a sudden and significant mismatch between supply and demand. Prior to the crisis, the rate had never risen above 2.0 percent. See **Exhibit 36A**. Rising vacancy rates typically lead to downward pressure on home prices, as sellers with vacant homes would be motivated to cut prices to meet continuing mortgage obligations or to minimize carrying costs.[164]

120. The increase in the vacancy rate was particularly acute in the key new-home markets of Florida, Nevada, and Arizona, in which vacancies peaked at 5.1, 5.3, and 3.8 percent, respectively, all well above the national rate and well above the historical averages for those states. See **Exhibit 36B**. Note that in each of these markets, as well as in the U.S. on the whole, vacancy rates were clearly headed upward by the first quarter of 2006 (if not earlier), well ahead of the decline in prices that occurred in 2007. See **Exhibit 36C**.

121. The mismatch of supply and demand was also apparent in the existing-home market.[165] The volume of existing-home sales peaked in mid-2005, then fell steadily through much of 2006 and 2007, again suggesting a softening in demand well before the price declines observed later. See **Exhibit 37A**. As sales fell, existing-home inventory began to climb. The number of existing homes for sale, which had hovered in the range of 2 to 2.5 million homes in the early 2000s, climbed to more than 3.5 million homes in May 2006 and to more than 4.0 million in July 2007. Months' supply, an estimate of the size of the existing-home inventory relative to the concurrent pace of sales, climbed from a low of 3.6 months in January 2005 to

[164] *See, e.g.*, Vladimir Klyuev, "What Goes Up Must Come Down? House Price Dynamics in the United States," IMF Working Paper No. 08/187 (July 2008), p. 11.

[165] The existing-home market refers to the market for all previously owned homes.

more than 7 months in mid-2006, and to more than 10 months by September 2007.[166] See **Exhibit 37B**.

4. As investors exited the market, prices softened further.

122. As noted above, investors in non-owner-occupied housing found the market increasingly attractive while home prices climbed in the early 2000s. In 2006, however, that trend reversed. The percentage of new mortgage loans used to purchase non-owner-occupied homes fell from more than 16 percent in 2005 to less than 11 percent in 2009. See **Exhibit 29**. Such declines were reportedly fastest in active investor markets such as Arizona, California, Florida, and Nevada.[167]

123. The exit of investors hastened the growing mismatch between supply and demand and contributed to the downward pressure on prices. These effects can be observed not only in geographic markets, like those above, but also in certain price segments within such markets. In Los Angeles, Miami, Phoenix, and Las Vegas, for example, the sharpest price increases, as well as the sharpest subsequent price declines, occurred in the bottom third of the market. See **Exhibits 38A to 38D**. These were reportedly the markets in which investors and redevelopers were most active.[168]

[166] Months' supply is the inventory at the end of a given month divided by the seasonally adjusted annualized closed sales for that month divided by 12. National Association of Realtors, Research Data FAQ, <http://www.realtor.org/research-and-statistics/research-data-faq>.

[167] *See* Eric S. Belsky and Nela Richardson, "Understanding the Boom and Bust in Nonprime Mortgage Lending," Joint Center for Housing Studies of Harvard University (September 2010), p. 81.

[168] *Id*. The bottom third of the market would also be the most active among credit-constrained subprime borrowers, the segment of the market most directly affected at the margin by the introduction of new mortgage products. This may also have contributed to the observed price effects.

5. Banks tightened their lending standards.

124. Referring again to the OCC's annual survey of credit underwriting practices (see paragraph 74, supra), an increasing number of bank examiners reported that banks had begun tightening credit standards beginning in 2007. By 2008, more than half of respondents reported tightening standards in most loan categories. See **Exhibits 15A to 15D**. In high-LTV home equity loan portfolios, nearly all respondents reported tightening standards in 2008. See **Exhibit 15D**.

125. As the housing market softened, borrowers faced reduced availability of credit, due to generally higher rates and increasingly strict terms. Such factors directly or indirectly affected the cost of homeownership, not only for potential buyers but for some existing owners as well (such as those facing interest-rate resets on adjustable-rate mortgages), further reducing demand.

126. Another indication of the changing credit environment was the growing spread between the interest rates on conforming and non-conforming loans. Higher rates on non-conforming loans are intended to compensate lenders for a perceived increase in default risk associated with such loans, as well as liquidity risk arising from reduced investor interest in subprime loans; the spread between the two reflects lenders' pricing of those risks. This spread increased from 21 basis points (0.21 percent) in January 2007 to 170 basis points (1.70 percent) in December 2008, meaning that prospective borrowers faced a higher premium for non-conforming loans. See **Exhibit 39**.

127. The reduced availability of credit had a particularly deleterious effect on borrowers with interest-only loans or loans with teaser rates.[169] Many such borrowers expected to refinance their mortgages once the low initial rate or interest-only period expired. Higher-than-expected interest rates and stricter loan terms in many cases made refinancing far more expensive than expected, if not altogether impossible, leading to an increase in the incidence of default, as I discuss in the following section.[170]

6. Falling home prices and worsening economic conditions triggered an increase in delinquency and default.

(a) Falling home prices triggered an increase in delinquency and default.

128. When the outstanding principal balance of a mortgage exceeds the current market value of the home, the owner is left with *negative equity*. With the sharp decline in home prices that began in 2007, coupled with the relatively recent vintage of so many owners' mortgages and the substantial volume of high-LTV and home equity loans, the housing and mortgage markets experienced a dramatic increase in the number of owners with negative equity. By the end of 2009, approximately 24 percent of all mortgaged residential properties in the U.S. had negative equity, including 48 percent in Florida, 70 percent in Nevada, 51 percent in Arizona, and 35 percent in California.[171] Indeed, by the fourth quarter of 2007, for the first time in at least 62

[169] In fact, all ARM borrowers faced increased borrowing costs if their rates reset after 2003. Thirty-day LIBOR (the rate to which most ARMs are indexed) increased sharply between 2004 and 2006. In January 2003, the rate was approximately 1 percent; by mid-2006 it had passed 5 percent, eventually peaking at 5.82 percent in early September of 2007. *See* **Exhibit 40**.

[170] *See, e.g.*, Alistair Barr, "'Tsunami' of adjustable-rate mortgage resets coming," *MarketWatch*, March 23, 2007. See also Jack Guttentag, *The Mortgage Encyclopedia*, 2nd ed. (New York: McGraw-Hill, 2010), pp. 6–9.

[171] First American CoreLogic, "Underwater Mortgages On the Rise According to First American CoreLogic Q4 2009 Negative Equity Data," February 23, 2010.

years, U.S. homeowners in aggregate owed more on their homes than they enjoyed in equity. See **Exhibit 41**.[172]

129. Default may become an increasingly attractive option to homeowners who find themselves with negative equity in their homes. When the cost of default is low, such as when loan provisions or state law provide the lender no recourse to the borrower's other assets, the appeal may grow further.[173] Default may also increase when the value of default is high, such as when mitigation efforts or foreclosure moratoria delay the foreclosure process. The longer the expected duration of the foreclosure process (because the borrower's residency may continue without further payment), the higher the expected value of default. One study found, based on analysis of loans originated from 2005 to 2007, that a three-month delay in expected foreclosure duration increased the risk of default by approximately 33 percent, which the authors found "is equivalent to the same marginal effect of increasing the LTV ratio by 11.06 percent or a decrease in the FICO score by 32.83 points."[174]

130. In short, a mortgage carries an embedded put option — the owner may choose to retain the home, preserving her credit rating and accepting the risk that the house will not increase in value before she must sell, or she may transfer that risk to the lender by defaulting on her loan and abandoning the home.

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[172] Though not shown in the exhibit, available data for this series begin in Q4 1945. See Board of Governors of the Federal Reserve System, Flow of Funds Accounts of the United States, Households; owners' equity in real estate as a percentage of household real estate (FL155035066.Q), available at <http://www.federalreserve.gov/apps/fof/FOFTables.aspx>.

[173] *See, e.g.*, Andra C. Ghent and Marianna Kudlyak, "Recourse and Residential Mortgage Default: Evidence from US States," *The Review of Financial Studies*, vol. 24, no. 9 (2011), p. 3177. In some states, referred to as "non-recourse" states, a lender can seek recovery of its losses only by seizing and selling a home through foreclosure. A lender may not seek additional assets from the borrower to make up the difference between the foreclosure sale price and the amount of the loan. Jack P. Friedman, et al., *Dictionary of Real Estate Terms,* 7th ed. (Hauppauge, NY: Barron's Educational Series, Inc., 2008), p. 334.

[174] *See, e.g.*, Shuang Zhu and R. Kelley Pace, "The Influence of Foreclosure Delays on Borrower's Default Behavior," April 19, 2011, p. 12, available at <http://ssrn.com/abstract=1717127> (accessed July 9, 2014).

131. Indeed, as prices fell, delinquencies soared. From mid-2005 to late 2009, serious delinquencies (delinquencies of 90 days or more, plus foreclosure inventory) on subprime mortgages increased more than five times, from 5.7 percent to almost 30.6 percent, and even on prime mortgages delinquencies increased approximately ten times, from 0.7 percent to 7.0 percent. See **Exhibit 42**.

132. These challenges were not limited to the residential mortgage market. For example, 30-day delinquencies on commercial real estate loans increased almost nine-fold between 2006 and 2009 while prices on commercial real estate fell nearly a quarter. See **Exhibit 43**. Delinquencies on other consumer loans, such as credit cards, increased as well. See **Exhibit 44**.

133. In the rising home-price environment of 2000 to early 2006, increased values had given borrowers a growing equity cushion against which they could borrow. In fact, by 2006, home equity loans had grown to approximately 14 percent of all new residential mortgage originations. See **Exhibit 17**. As prices declined, however, that cushion disappeared, and many such borrowers also found themselves with negative equity, further contributing to defaults. See **Exhibit 45**.

134. Finally, declining home prices were also problematic for borrowers who had taken advantage of lenders' offerings of short-term "hybrid" mortgages. In this type of mortgage, a low initial interest rate is offered for a period of two or three years before resetting to an adjustable rate tied to one of several benchmarks. About 75 percent of subprime mortgages and 10 percent of Alt-A mortgages originated between 2003 and 2007 were short-term hybrids.[175]

[175] *See* Christopher Mayer, Karen Pence, and Shane M. Sherlund, "The Rise in Mortgage Defaults," *Journal of Economic Perspectives*, vol. 23, no. 1 (Winter 2009), p. 30.

Many such borrowers expected to refinance their mortgages before the expiration of the introductory term, as the increase in interest rates (and therefore monthly payments) could be substantial. That strategy, which depended upon the continued increase in the value of the home, was frustrated when home prices fell.

135. The Joint Center for Housing Studies at Harvard University described the effect that delinquency and foreclosure had on the housing market as the crisis progressed:

> [T]he entire gain in the homeownership rate from 1999 to 2004 was reversed by the third quarter of 2009. . . . [F]oreclosures became an incessant and destructive force in the housing market, dragging down house prices, boosting the inventory of homes for sale, and destroying home equity for millions of American households.[176]

As the crisis progressed, lenders were forced to begin liquidating their growing inventories of abandoned or foreclosed properties and agree to an increasing number of short sales.[177] Sales of such properties, which combined accounted for less than two percent of home sales in the U.S. in 2006, grew to a combined total of more than 38 percent of all homes sales in the first quarter of 2009. See **Exhibit 46A**. The number of sales grew from a combined total of fewer than 60,000 in 2006, to more than 800,000 in 2008, and to more than 1 million each year from 2009 through 2011. See **Exhibit 46B**.

136. The increase in foreclosures contributed further downward pressure on home prices. A 2009 study by John P. Harding, Eric Rosenblatt and Vincent Yao concluded that having a neighboring property in the process of foreclosure can result in a discount to market

[176] Eric S. Belsky and Nela Richardson, "Understanding the Boom and Bust in Nonprime Mortgage Lending," Joint Center for Housing Studies of Harvard University (September 2010), p. 80.

[177] A *short sale* refers to a lender's acceptance of a sale price less than the outstanding principal balance of the loan. *Real estate owned* (or "REO") refers to properties owned by the bank following foreclosure. Jack Guttentag, *The Mortgage Encyclopedia*, 2nd ed. (New York: McGraw-Hill, 2010), p. 298; Jack P. Friedman, et al., *Dictionary of Real Estate Terms*, 7th ed. (Hauppauge, NY: Barron's Educational Series, Inc., 2008), pp.447–48.

value of up to one percent per nearby distressed property.[178] Donald Bisenius, executive vice president of the single-family business at Freddie Mac, agreed that contagion can have an effect not only on property values but also on the performance of mortgage loan portfolios:

> What I didn't fully appreciate, as I say here, is the fact that the loans in that portfolio are on houses that sit next to houses with loans in other people's portfolios. And what happens to the loans on those houses in the same neighborhood on other people's portfolio can impact the performance of the loan that I held in -- or Freddie Mac held in its portfolio. . . .[179]

137. Although it may certainly be argued that many factors contributed to the increase in defaults — changes in loan and borrower characteristics, for example, as well as adverse macroeconomic conditions — a number of empirical studies have concluded that the primary driver was the steep and unanticipated decline in home prices and not the proliferation of alternative mortgage products or a relaxation of lending standards.

138. Christopher Mayer of Columbia University, for example, and his co-authors, Karen Pence and Shane M. Sherlund of the Federal Reserve Board, found "substantial evidence that declines in house prices are a key factor in the current [2009] problems facing the mortgage market."[180]

139. Other studies have been more explicit in identifying cause and effect:

> As shown by numerous academic studies . . . a necessary condition for large numbers of borrowers to default is for house prices to fall below the value of the underlying mortgages. . . . [T]he academic literature shows that the primary condition is a decline in house price. **Indeed, it was not until home prices in certain markets,**

[178] John P. Harding, Eric Rosenblatt, and Vincent W. Yao, "The Contagion Effect of Foreclosed Properties," *Journal of Urban Economics*, vol. 66. no. 3 (November 2009), pp. 164–178.

[179] Deposition of Donald Bisenius, December 6, 2013, 606:4–11.

[180] Christopher Mayer, Karen Pence, and Shane M. Sherlund, "The Rise in Mortgage Defaults," *Journal of Economic Perspectives*, vol. 23, no. 1 (Winter 2009), p. 29.

> **notably California, Florida, Arizona, and Nevada, began to fall that subprime defaults became substantial**.[181]

140. In a study specifically of subprime mortgages originated in the U.S. between 2001 and 2007, the authors found that "[t]he only variable . . . that contributed substantially to the crisis [was] the low subsequent house price appreciation for vintage 2006 and 2007 loans . . . ." This held true for all categories of loans, not just subprime and Alt-A loans:

> We document that the poor performance of the vintage 2006 and 2007 loans was not confined to a particular segment of the subprime mortgage market. For example, fixed-rate, hybrid, purchase-money, cash-out refinancing, low-documentation, and full-documentation loans originated in 2006 and 2007 all showed substantially higher delinquency rates than loans made the prior five years. This contradicts a widely held belief that the subprime mortgage crisis was mostly confined to hybrid or low-documentation mortgages.[182]

141. A study by the Federal Reserve Bank of Atlanta came to a similar conclusion, finding that "underwriting standards alone cannot explain the dramatic rise in foreclosures."[183] The authors of the study asked, in particular, whether lenders and other market participants should have anticipated the large increase in foreclosures, and found that it was primarily the unexpected magnitude and suddenness of the drop in home prices that led to losses:

> [G]iven available data, market participants should have been able to understand that a significant fall in prices would cause a large increase in foreclosures although loan-level . . . models would have

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[181] Richard J. Buttimer, Jr., "The financial crisis: imperfect markets and imperfect regulation," *Journal of Financial Economic Policy*, vol. 3, no. 1 (2011), p. 17 (emphasis added) (citing James F. Epperson, et al., "Pricing default risk on mortgages," *AREUEA Journal*, vol. 13, no. 3 (1985), pp. 261–72; Jimmy E. Hilliard, James B. Kau, and V. Carlos Slawson Jr., "Valuing prepay and default in a fixed-rate mortgage: a bivariate binomial options pricing 46technique," *Real Estate Economics*, vol. 26, no. 3 (1998), pp. 431–68; and Brent W. Ambrose and Richard J. Buttimer, "Embedded options in the mortgage contract," *The Journal of Real Estate Finance & Economics*, vol. 21, no. 2 (2000), pp. 95–112).

[182] Yuliya Demyanyk and Otto Van Hemert, "Understanding the Subprime Mortgage Crisis," *The Review of Financial Studies*, vol. 24, no. 6 (2011), p. 1849.

[183] Kristopher Gerardi, et al., "Making Sense of the Subprime Crisis," Federal Reserve Bank of Atlanta Working Paper 2009-2 (February 2009), p. 1.

> predicted a smaller rise than actually occurred. Examining analyst reports and other contemporary discussions of the mortgage market to see what market participants thought would happen, [we] find that analysts, on the whole, understood that a fall in prices would have disastrous consequences for the market but assigned a low probability to such an outcome.[184]

142. A subsequent study by the Atlanta Fed again focused on the question of whether home price depreciation or a relaxation of underwriting standards was the primary driver of the foreclosure crisis. The study confirmed the finding of the previous paper:

> **We find that had prices not fallen, we would simply not have had a major foreclosure crisis**, regardless of whether lenders had lowered underwriting standards in 2003 and 2004. By contrast, the observed fall in prices would have generated a substantial increase in foreclosures, even if lenders had retained the underwriting standards that prevailed in 2002.[185]

143. Finally, numerous officials at both Fannie Mae and Freddie Mac have testified that home prices were the key factor driving the increase in defaults. Gary Kain, for example, Freddie Mac's former senior vice president for investments in capital markets, testified that the "cratering" of home-price appreciation in 2008 was a key factor in the losses on Freddie Mac's portfolio of private-label securities.[186] Caijiao Zhao, a Fannie Mae principal economist and director of portfolio risk analysis, testified that default severity "all depends on home prices," and that home price appreciation is a "huge modeling input" which affects "everything in the model."[187] And Eric Rosenblatt, Fannie Mae's vice president for credit risk analytics and

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[184] *Id*.

[185] Kristopher Gerardi, Adam Hale Shapiro, and Paul S. Willen, "Decomposing the Foreclosure Crisis: House Price Depreciation versus Bad Underwriting," Federal Reserve Bank of Atlanta Working Paper 2009-25 (September 2009), p. 1 (emphasis added). *See also* Christopher Palmer, "Why Did So Many Subprime Borrowers Default During the Crisis: Loose Credit or Plummeting Prices?," Job Market Paper (November 15, 2013).

[186] Deposition of Gary Kain, November 6, 2013, 140:20–142:17.

[187] Deposition of Caijiao Zhao, June 26, 2013, 380:24–381:25.

monitoring, testified that "if home prices had not fallen, we wouldn't be having this discussion."[188]

144. State level data for foreclosure starts and home prices support these conclusions. States that experienced larger declines in home prices experienced a larger percentage of foreclosures. In Nevada, for example, which from June 2006 through December 2013 experienced a nearly 50 percent decline in home prices, average default rate for that period was 2.0 percent. In fact, each of the states with the four greatest declines in home prices over the same period — Nevada, Florida, Arizona, and California — were among the states with the highest default rates. By way of comparison, the national average default rate in that period was 0.9 percent. See **Exhibit 47**.

(b) Increased unemployment added to the frequency of delinquency and default.

145. In 2007, as the economy worsened, unemployment in the U.S. began to climb. By the end of 2009, unemployment had reached its highest level in more than a quarter-century.[189] Unemployment not only reduces demand for housing, it also compounds the effect of falling home prices on the incidence of delinquency and default.

146. When home prices are stable or appreciating, a homeowner who loses her job has the option to sell and is therefore less likely to default. When home prices are falling, particularly when unemployment is persistent that option is often negated.[190] As a result, the likelihood of

[188] Deposition of Eric Rosenblatt, November 8, 2013, 187:19–188:8. *See also* Deposition of Joseph Paul Norris, July 11, 2013, 648:21–650:20; Deposition of Peter Niculescu, December 10, 2013, 51:20–52:16.

[189] U.S. Bureau of Labor Statistics, Labor Force Statistics from the Current Population Survey (LNS14000000), available at <http://data.bls.gov/> (accessed July 9, 2014).

[190] Between April 2006 and April 2009, a period defined by unprecedented declines in home prices, the long-term unemployment rate increased by nearly 50 percent from 18.6 percent to 27.1 percent, the highest level of long term unemployment ever recorded by the BLS at that time. National long term unemployment data are available starting

delinquency and default increases.[191] In fact, the probability of default is highest at the intersection of these two events.[192]

147. This conclusion is again supported by available data. Across the U.S., states that experienced large increases in unemployment, such as Arizona, California, Florida and Nevada, also experienced a higher percentage of seriously delinquent loans. See **Exhibit 48**. Similarly, a study by the Federal Reserve Board observed that heightened delinquencies in Ohio, Michigan, and Indiana (among the first states to experience such increases) "were preceded by difficult economic conditions, including three to four years of elevated unemployment rates and at least one to two years of stagnant to falling home prices."[193]

7. With the increased occurrence of default and foreclosure, the market for non-Agency securitized mortgages collapsed, with repercussions throughout the mortgage industry.

148. When home prices fell and mortgage loan performance faltered, the market for RMBS began to realize the risks that had previously been considered remote. Many asset-backed securities, including RMBS, are regularly evaluated by ratings agencies such as Moody's, Fitch, and Standard & Poor's. Their ratings reflect analysts' expectations of the performance of securities based in part on market factors and macroeconomic conditions. When such factors

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in January 1948. See U.S. Bureau of Labor Statistics, Labor Force Statistics from the Current Population Survey (LNS13025703), available at <http://data.bls.gov/> (accessed July 9, 2014).

[191] *See* Eric S. Rosengren, "Current Challenges in Housing and Home Loans: Complicating Factors and the Implications for Policymakers," Federal Reserve Bank of Boston, May 30, 2008, pp. 7–8; and Mortgage Bankers Association, "Statement of Robert E. Story, Jr., CMB, Chairman, Mortgage Bankers Association, before the Subcommittee on Housing and Community Opportunity Committee on Financial Services, United States House of Representatives, Hearing on 'The Recently Announced Revisions to the Home Affordable Modification Program (HAMP)'," April 14, 2010, pp. 3–4.

[192] *See* Kerry D. Vandell, "How Ruthless is Mortgage Default? A Review and Synthesis of the Evidence," *Journal of Housing Research*, vol. 6, no. 2 (1995), pp. 245–264.

[193] Christopher Mayer, Karen Pence, and Shane M. Sherlund, "The Rise in Mortgage Defaults," *Journal of Economic Perspectives*, vol. 23, no. 1 (Winter 2009), p. 45.

suggest heightened risk of adverse performance, the ratings agencies may issue downgrades, alerts, or other warnings to investors.[194]

149. In 2006, S&P announced downgrades affecting approximately one percent of its outstanding RMBS ratings (approximately 400 RMBS issuances), approximately the same percentage of downgrades as in the preceding five years.[195] (By contrast, in 2006, S&P announced upgrades on approximately four percent of its outstanding ratings; the remaining 95 percent were unchanged.) In 2007, S&P downgraded nearly 16 percent of its outstanding RMBS ratings, and in 2009 more than 70 percent. The latter represented more than 28,000 RMBS issuances.[196] See **Exhibit 49**.

150. The ratings downgrades occurred amid a growing number of bankruptcies and foreclosures among subprime and Alt-A lenders, driven, in part, by substantial increases in early payment defaults and growing repurchase demands. By early 2007, for example, Nomura originator Fremont Investment & Loan, Option One Mortgage, Ameriquest/Argent Mortgage, Accredited Home Lenders, and Nomura originator First NLC Financial all faced significant liquidity and mortgage repurchase issues.[197] In January 2007, Mortgage Lenders Network USA Inc. laid off 80 percent of its employees, then filed for bankruptcy in February.[198] With Merrill

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[194] For an overview of the ratings agencies, *see, e.g.*, Standard & Poor's Financial Services, Credit Ratings Definitions & FAQs, <http://www.standardandpoors.com/ratings/definitions-and-faqs/en/us> (accessed July 9, 2014).

[195] Robert B. Pollsen and Ernestine Warner, "Transition Study: U.S. RMBS Upgrades Are Down And Downgrades Are Up In 2006," Standard & Poor's, January 26, 2007, Table 5, p. 8, and pp. 53–61.

[196] Erkan Erturk, *et al.*, "Default Study: Global Structured Finance Default Study — 1978–2009: Downgrades Accelerate In 2009 Due To Criteria Changes And Credit Performance," Standard & Poor's, March 22, 2010, Table 3, p. 15.

[197] Alistair Barr, "Big banks control fate of subprime lenders," *MarketWatch*, February 16, 2007; "Four of Top 25 Go Bust," *National Mortgage News*, April 23, 2007; and E. Scott Reckard, "Ameriquest obtains funds from Citigroup," *Los Angeles Times*, March 1, 2007 (noting that ACC Capital, Ameriquest's parent company "had been pinched by . . . demands by loan buyers that it take back mortgages that quickly went into default.").

[198] "Mortgage Lenders Network files for Chapter 11," Reuters, February 5, 2007.

Lynch demanding $308 million in early payment default buy-backs, Nomura originator ResMae Mortgage Corp. filed for Chapter 11 bankruptcy in February 2007 as they lacked the liquidity to "cope with an 'enormous' surge in loan defaults."[199] New Century Financial Corp. filed for bankruptcy in April 2007 after losing most of its external liquidity sources, cutting 54 percent of its work force and selling its servicing assets.[200] In all, by August 2007, more than 70 mortgage companies had sought buyers or closed, and at least six had declared bankruptcy.[201]

151. In June 2007, Bear Stearns Asset Management froze redemptions on two of its hedge funds, both highly invested in subprime securities.[202] Minutes of the June 2007 meeting of the Federal Open Market Committee indicate concern about the funds, noting that "[t]he subprime mortgage space is still very unsettled—hurt both by poor housing market fundamentals and by the problems of two hedge funds sponsored by Bear Stearns."[203] The committee also observed that the spread on the ABX 06-2 index, a synthetic, tradable index of subprime mortgage-backed securities, had increased to a new high, suggesting that demand for subprime RMBS was beginning to plummet.[204]

152. In the third quarter of 2007, following a steady decline in the volume of non-agency issuances that began in mid-2005, the RMBS market collapsed. The total volume of new non-agency RMBS issuances fell from $259 billion in the second quarter of 2007 to $124 billion

[199] Bradley Keoun and Jody Shenn, "ResMae Seeks Bankruptcy; Credit Suisse to Buy Assets (Update5)," Bloomberg, February 13, 2007.

[200] "New Century Files for Chapter 11 Bankruptcy," CNN Money, April 3, 2007.

[201] "Home loan crisis affects more firms," *Los Angeles Times*, August 3, 2007.

[202] Matthew Goldstein, "Bear Stearns to the Rescue – Sort Of," *Bloomberg Businessweek*, June 22, 2007, <http://www.businessweek.com/stories/2007-06-22/bear-stearns-to-the-rescue-sort-ofbusinessweek-business-news-stock-market-and-financial-advice> (accessed July 9, 2014).

[203] Transcript of the Meeting of the Federal Open Market Committee on June 27–28, 2007, p. 6.

[204] *Id*.

in the third quarter, and to just $53 billion in the fourth quarter. See **Exhibit 50A**. The collapse in non-agency securitizations was not limited to a single type or category of RMBS, such as subprime or Alt-A; all categories contracted significantly. See **Exhibit 50B**.

153. Again, access to capital drives the mortgage-lending industry. Without it, loan originations must fall. Indeed, even as lenders faced declining loan performance and increased repurchase demands, struggles in the RMBS market limited their access to capital. Such limitations no doubt contributed to the numerous failures among originators discussed in paragraph 150 above.

8. The increase in defaults led to downgrades among monoline insurers.

154. The increase in defaults affected other industry participants as well. Monoline insurers had played an increasingly important role in the securitization market by providing credit enhancements to securitized mortgage products. Together with the ratings agencies, the monoline insurers provided assurance to investors that helped to ensure the salability of securitized products — even those comprised of higher-risk subprime mortgages.[205] At the close of 2006, the nine leading monoline insurers insured a combined total of $154.9 billion of U.S. RMBS.[206]

155. In July 2007, Radian Group Inc., the parent company of Radian Asset Assurance Inc. (which, among other things, provided credit enhancement for mortgage-backed securities), reported an 86-percent year-over-year drop in net income, which it attributed primarily to

[205] For a further discussion of the role of the monoline insurers in the mortgage securitization industry, see, e.g., Sebastian Schich, "Challenges Related to Financial Guarantee Insurance," *Financial Market Trends* (2008), pp. 90–96.

[206] Association of Financial Guaranty Insurers, Combined Financial Highlights <https://web.archive.org/web/20070804181817/http://www.afgi.org/pdfs/2006financialcharts.pdf>.

mortgage defaults.[207] Ambac Financial Group announced a 27-percent drop in net income, also in the second quarter.[208] As the incidence of mortgage default climbed through 2007, losses spread throughout the monoline industry. In December 2007, Standard & Poor's announced the first in a series of downgrades affecting the monoline insurers. By October 2010, of the nine leading monoline insurers with structured finance portfolios — all of which had maintained high-investment-grade ratings throughout their histories — all but two had been downgraded below investment grade.[209] See **Exhibit 51**. As with the RMBS ratings downgrades discussed above, the losses of the monoline insurers were another indicator of growing market-wide instability.

C. The Unprecedented Depth and Duration of the Housing Market Decline and Its Effect on the Broader Economy Were Unexpected

1. Many sophisticated market participants failed to anticipate the severity of the decline.

156. The depth and duration of the housing market decline were far greater than most market participants expected. While some debated whether the upward trajectory of home prices

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[207] Matthew Hanson , "Radian Reports Drop in 2Q Net Income; New Production Falls to $268 Million," *The Bond Buyer*, July 26, 2007 (Factiva).

[208] Ambac Financial Group, Inc., "Ambac Financial Group, Inc. Announces Second Quarter Net Income of $173.0 Million, Down 27%," July 25, 2007.

[209] Of the two exceptions, one, Assured Guaranty Corp., held relatively limited exposure to subprime and home equity RMBS as of 2007. See Assured Guaranty Ltd. Form 10-K for the fiscal year ended December 31, 2007, Exhibit 99.1, p. 17. The other, Financial Security Assurance, Inc., was acquired by Assured. *See* "Assured Guaranty Ltd. Changes Name of Subsidiary Financial Security Assurance Inc. to Assured Guaranty Municipal Corp.," Business Wire, November 2, 2009. *See also* Association of Financial Guaranty Insurers, Who We Are (as of March 19, 2007) <http://web.archive.org/web/20070319084518/http://www.afgi.org/whoweare.htm> (accessed July 9, 2014).

Definitions vary by rating agency, but using Standard & Poor's rating system, ratings of BB+ or below are referred to as "Speculative Grade," or, more informally, "junk." *See* Standard & Poor's, "Guide to Credit Rating Essentials: What are credit ratings and how do they work?," 2011, p. 10, available at <http://img.en25.com/Web/StandardandPoors/SP_CreditRatingsGuide.pdf>.

experienced in 2003 through 2005 was sustainable, few regarded a broad housing market decline as a likely event.[210]

157. Indeed, prior to 2006, markets had cleared through temporary reductions in housing starts or sales volume and without significant or lasting reductions in price.[211] The few, rare nationwide reductions in price were brief. See **Exhibit 2**. Thus, even as prices flattened during the 13 months from April 2006 through April 2007, it was not unreasonable for market participants to expect a recovery, and many did.

158. For example, in an August 2005 study, analysts at Lehman Brothers estimated potential losses to a pool of subprime loans under a variety of home-price-change scenarios. The study's base case, which assumed that annual home-price appreciation would slow to five percent by the end of 2005, was assigned a probability of 50 percent; a "pessimistic" scenario, which assumed that home-price appreciation would be zero for three years and five percent thereafter, was assigned a probability of 15 percent; and a "meltdown" scenario, which assumed that home-price appreciation would be negative five percent for the three years and positive five percent thereafter, was assigned a probability of only five percent. Clearly, Lehman Brothers' expectations of even a modest decline in home prices were quite low, and none of its scenarios contemplated a decline of more than five percent per year.[212]

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[210] In addition to the market participants discussed in this section, homebuyers themselves continued to maintain optimistic expectations, both in the short and long run, about the future growth of home prices during the 2006 and 2007 time period. While some cautious short-run expectations were evident in 2007, they were still far more optimistic than what occurred shortly after. This is evidence of what some have called a characteristically "sticky" housing market in which owners are slow to recognize coming price declines, resulting in later, but steeper future price declines. See Karl E. Case, Robert J. Shiller, and Anne K. Thompson, "What Have They Been Thinking? Homebuyer Behavior in Hot and Cold Markets," *Brookings Papers on Economic Activity*, Fall 2012, pp. 265–298.

[211] Karl E. Case, "The Central Role of Home Prices in the Current Financial Crisis: How Will the Market Clear?," *Brookings Papers on Economic Activity*, Fall 2008, pp. 176–179. Case's analysis uses data as far back as the 1970s.

[212] The study also included two other home-price-change scenarios that were more optimistic. One scenario assumed that annual home-price appreciation would be eight percent over the life of the mortgage pool, and was assigned a probability of 15 percent. The other — and most optimistic — scenario assumed that annual home-price

159. More than a year later, in December 2006, the office of the chief economist at Freddie Mac published its expectation that prices would continue to grow, albeit at a slower rate, and that any downturns would be isolated:

> Nationally, house prices will likely appreciate around the rate of consumer price inflation, although there is a potential for real declines and some hard-hit areas will need greater improvements in the local economy before experiencing a housing recovery. With smaller price gains and reduced opportunities to extract equity, mortgage debt will grow more slowly. In short, housing markets will move off center stage, but will resume quietly providing homes and opportunities to build a nest egg for millions of American households.[213]

160. Through 2006, the Mortgage Bankers Association continued to predict increasing home prices. In January 2007, it proclaimed that "[t]he housing market is nearly back to normal."[214] In its quarterly forecast of new home prices issued in the first quarter of 2007, the MBA finally recognized the probability of a decline, but only in the near term. Its two- and three-year forecasts were still positive. See **Exhibits 52 and 53**.

161. That is not to say that the risk of a decline in prices was unknown or unremarked. By the mid-2000s, the possibility that a "bubble" was forming in the housing market had been observed by many, including such prominent economists as Karl Case and Robert Shiller, Dean Baker of the Center for Economic and Policy Research, and Paul Krugman of Princeton University and *The New York Times*.[215]

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appreciation would be 11 percent over the life of the mortgage pool, and was also assigned a probability of 15 percent. *See* Lehman Brothers, Fixed-Income Research, "U.S. ABS Weekly Outlook," August 15, 2005, pp. 3, 5.

[213] Frank Nothaft, *et al.*, "December 2006 Economic Outlook: Anatomy of a Housing Recovery," Office of the Chief Economist at Freddie Mac, December 2006, p. 1.

[214] Michael Fratantoni, *et al.*, "The Residential Mortgage Market and Its Economic Context in 2007," Mortgage Bankers Association, January 30, 2007, p. 1.

[215] *See, e.g.*, Karl E. Case and Robert J. Shiller, "Is There a Bubble in the Housing Market?," *Brookings Papers on Economic Activity*, vol. 2 (2003); Dean Baker, "The Run-up in Home Prices: Is It Real or Is It Another Bubble?,"

162. Similarly, in an interview published in *Businessweek* in early 2006, former Countrywide CEO Angelo Mozilo predicted a decline in home prices of five to ten percent nationally, and stated that "in areas where you have had heavy speculation, you could have 30%."[216] In the same article, economist Robert Shiller stated that he believed that continuing strong price appreciation is not realistic and that "a pullback of as much as 40% is plausible in many places."[217] Quotes from the article were apparently shared among some Fannie Mae personnel.[218]

163. Such observations increased in frequency over time, and, while no consensus was reached as to the expected duration of the boom or the severity of a bust, academics, the press, and other market observers openly and publicly debated such topics.[219] In retrospect, such risks were not adequately measured; the flaw, however, was not only in the methodology but also in the assumptions used in constructing analytical models of default and limitations of the available data. As Goetzmann, et al., argue:

> [S]tandard trend-based econometric models using data up to 2006 forecast low probabilities for a crash in the near term. *Ex post*, these models were completely wrong. *Ex ante*, however, there was no consensus of model failure, even among professional economists. . . .[220]

Center for Economic and Policy Research Briefing Paper, 2002; and Paul Krugman, "That Hissing Sound," *The New York Times*, August 8, 2005.

[216] Maria Bartiromo, "Jitters On The Home Front," *Bloomberg Businessweek*, March 5, 2006, <http://www.businessweek.com/stories/2006-03-05/jitters-on-the-home-front> (accessed July 9, 2014).

[217] *Id*.

[218] Email from Michael A. Quinn to Pamela Johnson, re "FW: Countrywide predicts home price decline!!!," February 28, 2006 (FHFA03460244).

[219] *See* Kristopher Gerardi, Christopher L. Foote, and Paul S. Willen, "Reasonable People Did Disagree: Optimism and Pessimism About the U.S. Housing Market Before the Crash," Federal Reserve Bank of Boston, Public Policy Discussion Paper No. 10-5, September 10, 2010.

[220] William N. Goetzmann, Liang Peng, and Jacqueline Yen, "The Subprime Crisis and House Price Appreciation," *The Journal of Real Estate Finance and Economics*, vol. 44, no. 1-2 (January 2012), pp. 37–38.

> [I]t is difficult to argue that *ex ante* behavior by housing market participants was irrational if expectations could be justified by imperfect but standard models of expectation.[221]

164. Karl Case explained the problem further:

> The problem was that the regressions on which the automated systems were based had been run with data from a 30-year period of continuously rising national home prices, where regional price declines coincided with regional economic performance. Thus, the model concluded that as long as a portfolio was regionally diversified and pricing was based on credit scores, loan-to-value ratios, and so forth, the business would be profitable. When instead home prices declined everywhere and the regional cycles became more synchronized, the model no longer fit the data.[222]

165. Even as prices fluctuated in 2006, the GSEs increasingly viewed expansion into non-prime loans as an opportunity to recapture market share and increase profitability. According to Mr. Lund, Fannie Mae's decision to expand its purchases of non-traditional mortgage products was motivated in part by corporate goals set in early 2006 by its board of directors to recapture as much as 35 percent of the market.[223] The only way to achieve such goals, according to Mr. Lund, was "to get more aggressive in acquiring Alt-A loans."[224]

166. Officials at Freddie Mac also viewed the growing market turmoil as an opportunity. In February 2007, in a memorandum shared with several fellow officers at Freddie Mac, Freddie Mac's head of investments and capital markets, Gary Kain, observed that "[t]he

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[221] *Id*., p. 41.

[222] Karl E. Case, "The Central Role of Home Prices in the Current Financial Crisis: How Will the Market Clear?," *Brookings Papers on Economic Activity*, Fall 2008, p. 184. See also Kristopher Gerardi, et al., "Making Sense of the Subprime Crisis," Federal Reserve Bank of Atlanta Working Paper 2009-2 (February 2009), pp. 47–48.

[223] Memorandum for the Record, March 4, 2010, p. 6, available at <http://fcic-static.law.stanford.edu/cdn_media/fcic-docs/2010-03-04%20FCIC%20memo%20of%20staff%20interview%20with%20Thomas%20Lund,%20Fannie%20Mae.pdf> (accessed July 9, 2014).

[224] Memorandum for the Record, March 4, 2010, p. 7, available at <http://fcic-static.law.stanford.edu/cdn_media/fcic-docs/2010-03-04%20FCIC%20memo%20of%20staff%20interview%20with%20Thomas%20Lund,%20Fannie%20Mae.pdf> (accessed July 9, 2014).

combination of the market shakeout and the political pressure are likely to materially impact the subprime market," and that it was time "to step into the subprime market in a broader fashion and provide leadership in shaping what the market looks like in the future."[225]

167. At a March 2007 meeting, Freddie Mac's board of directors considered "an Opportunity to Expand Into Markets We Have Missed – Subprime and Alt-A."[226] The presentation argued that "Nonprime Could Contribute Significant Earnings" and that the "Potential Economics of Nonprime Are Attractive."[227] Freddie Mac personnel projected that minority households would account for approximately 70 percent of all household growth between 2000 and 2020, and that three to six million first-time homebuyers would be likely to take out subprime loans during the succeeding 10 years. Expansion into subprime therefore represented "an alignment of business opportunity and mission fulfillment."[228] The presentation also expressly acknowledged the growing turmoil in the mortgage financial markets when it described the "next 12-24 months of retrenchment and low liquidity [as] an opportunity to recapture what we ceded in the past decade."[229]

168. Mr. Niculescu testified that "market dislocations can create opportunities as well as risks," and that "at the time we viewed the purchase of subprime securities as potentially a profitable activity . . . for our shareholders . . . ."[230] Mr. Niculescu stressed that Fannie Mae officials regarded the market disruption as an opportunity: "[W]e viewed [that] . . . the market

[225] Memorandum from Gary Kain to Eugene McQuade, et al., re Subprime Alternative (with attachment, "Potential Approach to Subprime Situation"), February 15, 2007 (BLK01534–539 at BLK01536, 537).

[226] "Freddie Mac's Business Strategy, Board of Directors Meeting," March 2–3, 2007 (FHFA01084113–191 at FHFA01084183).

[227] *Id*. at FHFA01084186, 187.

[228] *Id*. at FHFA01084178, 180.

[229] *Id*. at FHFA01084191.

[230] Deposition of Peter Niculescu, December 10, 2013, 362:2–20.

dislocation, as is often true for market dislocations, may have been conceivably an overreaction to the underlying credit riskiness of the securities."[231] The GSEs also continued to pursue purchases of whole loans and securities in furtherance of the housing goals as well as their obligation to provide liquidity to the market. In an email from Paul Norris to Mr. Niculescu in March 2007, Mr. Norris offered his opinion that improving prices offered a significant opportunity:

> Over last two years we were price takers. Now we can dictate price and terms. We should take advantage of this and improve the market. [¶] This is a great opportunity for Fannie Mae to provide liquidity, fulfill our mission, while providing our shareholders with solid returns.[232]

169. Significantly, by the spring of 2007, several large subprime lenders had already filed for bankruptcy under the weight of mortgage repurchase demands, driven, in part, by substantial increases in early payment defaults. (See discussion at paragraph 150, above.) Thus, while the duration and magnitude of the coming economic crisis may have been unexpected, clear indications existed by the summer of 2007 that originators of the loans backing many of the subprime and Alt-A securities in the market were failing as a result of early payment defaults and repurchase demands.

170. The GSEs' decision to take on more risk despite growing uncertainty of the direction of home prices and clear distress in the mortgage and financial markets supports the

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[231] Deposition of Peter Niculescu, December 10, 2013, 362:16–25; *see also* HCF Committee presentation, April 19, 2007 (FHFA01253168–220).

[232] Email from Paul Norris to Peter Niculescu, *et al.*, re "Subprime Discussion," March 2, 2007 (FHFA01152300–301). *See also* Deposition of Peter Niculescu, December 10, 2013, 40:14–41:9; HCF Committee presentation, April 19, 2007, pp. 9, 14 (FHFA01253168–220 at FHFA01253176, FHFA01253181); Email from Paul Norris to Frank Telesca, et al., re "FNMA Information on MSAC 2007-HE7," September 21, 2007 (FHFA00018263–64) (agreeing to purchase a security in September 2007 despite potential problems because "we are here to support the market, and provide liquidity, especially for this type of product") and Email from Kenneth L. Moskowitz to Bruce Wood, *et al.*, re "Non-Agency Investment Grade Bonds (AAA to BBB-) ver3.doc," September 11, 2007 (with attachment) (FHFA00533433–438 at FHFA00533435) (justifying proposed purchases of investment grade securities below AAA in part due to "the ability to provide stability and liquidity to the secondary mortgage market . . . .").

conclusion that officials at Fannie and Freddie believed that any economic downturn would be brief. Indeed, according to Mr. Lund, Fannie Mae saw minimal risk in the period before the crisis, and "if you told anyone that housing prices would decline by . . . 40%, they wouldn't have believed you."[233]

2. Similarly, the market failed to anticipate the effect the decline would have on the broader economy.

171. Repeatedly during the first half of 2007, even as the subprime crisis unfolded, economists, bankers and regulators expressed the belief that problems in the subprime sector were unlikely to spread to the broader credit markets or to the economy as a whole:

- In **February 2007**, Federal Reserve Chairman Ben Bernanke stated that the housing downturn was not "a broad financial concern or a major factor in assessing the state of the economy."[234]
- In **April 2007**, Richard Fisher, president of the Federal Reserve Bank of Dallas, stated, "Thus far, the damage from the subprime market has been largely contained. . . . [T]he financial system and the economy are strong enough to weather the storm."[235]
- In **April 2007**, Treasury Secretary Henry Paulson said, "I don't see [subprime mortgage market troubles] imposing a serious problem.

[233] Memorandum for the Record, March 4, 2010, p. 10, available at <http://fcic-static.law.stanford.edu/cdn_media/fcic-docs/2010-03-04%20FCIC%20memo%20of%20staff%20interview%20with%20Thomas%20Lund,%20Fannie%20Mae.pdf> (accessed July 9, 2014).

[234] John Cassidy, "Anatomy of a Meltdown; A Reporter at Large," *New Yorker*, December 1, 2008.

[235] Michael S. Derby, "Fed Fisher: Subprime Mortgage Trouble 'Largely Contained'," *Dow Jones Capital Markets Report*, April 4, 2007.

I think it's going to be largely contained."[236] In a **July 2007** interview, he reiterated "I don't deny you're going to see money lost in subprime mortgages . . . . But do I think these risks are contained? Yes, I do."[237]

- In its **April 2007** annual report, the International Monetary Fund opined that "weakness [in subprime mortgages] has been contained to certain portions of the subprime market (and, to a lesser extent, the Alt-A market), and is not likely to pose a serious systemic threat." The report added that "[s]tress tests conducted by investment banks show that, even under scenarios of nationwide house price declines that are historically unprecedented, most investors with exposure to subprime mortgages through securitized structures will not face losses."[238]

- In **May 2007**, Chairman Bernanke repeated his view that "the effect of the troubles in the subprime sector on the broader housing market will likely be limited, and we do not expect significant spillovers from the subprime market to the rest of the economy or to the financial system."[239]

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[236] "Treasury's Paulson — subprime woes likely contained," *Reuters*, April 20, 2007.

[237] "US's Paulson: Subprime 'At or Near the Bottom;' Need Vigilance," *Market News International*, July 23, 2007.

[238] Peter Dattels, *et al.*, "Assessing Global Financial Risks," in *Global Financial Stability Report*, International Monetary Fund, April 2007, p. 7.

[239] Ben S. Bernanke, "The Subprime Mortgage Market," Speech at the Federal Reserve Bank of Chicago's 43rd Annual Conference on Bank Structure and Competition, May 17, 2007, <http://www.federalreserve.gov/newsevents/speech/bernanke20070517a.htm>.

- And in **June 2007** Kim Daifotis, chief investment officer for fixed income at Charles Schwab Investment Management, said, "What we've seen so far has been pretty much well-contained and has affected neither the rest of the economy nor the credit market."[240]

172. Just two months after the last of these comments, U.S. financial markets froze. On August 9, 2007, French bank BNP Paribas suspended redemptions of certain of its asset-backed securities, complaining that "[t]he complete evaporation of liquidity in certain market segments of the US securitisation market has made it impossible to value certain assets fairly regardless of their quality or credit rating."[241] In a later assessment of the financial crisis, Fed governors commented that after August 9, 2007, "liquidity problems and short-term funding pressures intensified in Europe and emerged in U.S. money markets."[242]

173. One broad-based measure of uncertainty in the U.S. financial system is the Kansas City Financial Stress Index, published by the Federal Reserve Bank of Kansas City.[243] The index is designed such that zero represents the long-run average level of financial stress. A negative value represents below-average stress, and a positive value above-average stress. In the

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[240] Emma Trincal, "Subprime Contagion: Credit Bubble or Babble?," *HedgeWorld News*, June 29, 2007.

[241] BNP Paribas, "BNP Paribas Investment Partners temporaly [*sic*] suspends the calculation of the Net Asset Value of the following funds : Parvest Dynamic ABS, BNP Paribas ABS EURIBOR and BNP Paribas ABS EONIA," August 9, 2007, <http://www.bnpparibas.com/en/news/press-release/bnp-paribas-investment-partners-temporaly-suspends-calculation-net-asset-value-fo> (accessed July 9, 2014). *See also* "The financial crisis: Unhappy birthday," *The Economist*, August 9, 2012, <http://www.economist.com/blogs/schumpeter/2012/08/financial-crisis> (accessed July 9, 2014).

[242] Board of Governors of the Federal Reserve System, Monetary Policy Report to the Congress, February 27, 2008, p. 24.

[243] The Kansas City Financial Stress Index is a monthly measure of stress in the U.S. financial system based on 11 financial market variables, such as the spread between 3-month LIBOR and Treasury bills (also known as the "TED spread") and the spread between AAA corporate bonds and ten-year Treasury securities. For a more complete discussion of the index and its components, *see* Craig S. Hakkio and William R. Keeton, "Financial Stress: What Is It, How Can It Be Measured, and Why Does It Matter?," Federal Reserve Bank of Kansas City Economic Review, Second Quarter 2009, available at <http://www.kansascityfed.org/PUBLICAT/ECONREV/pdf/09q2hakkio_keeton.pdf>.

aftermath of the collapse of the Internet bubble and the economic downturn following 9/11, the index peaked at several points at levels just above 1.0. In just two months, from June 2007 to August 2007, the index rose more than one whole point, from –0.59 to 0.65; by October 2008, the index had jumped to 5.93. See **Exhibit 54**.

174. Given uncertainty in the valuation of RMBS, and in particular subprime RMBS, trading in the market for many securities effectively ceased after August 9th. Sellers and buyers held vastly divergent beliefs about the value of securities (as well as the level and sources of risk) and thus were unable to consummate otherwise elementary market transactions.[244] As normal trading activity stopped, information dwindled further.[245] The resulting asymmetries contributed to a self-perpetuating cycle of illiquidity:

> Liquidity is a self-reinforcing process; investors are more willing to buy an asset they know they can sell easily. But if liquidity suddenly dries up, some investors might end up owning assets they neither want nor can get rid of. That might make a virtuous circle turn vicious.[246]

175. *Ex ante*, it would have been difficult for participants in the mortgage and securitization markets to envision these developments. In the words of former Chairman Greenspan:

> At issue is whether the current crisis is that 'hundred year flood.' At best, once in a century observations can yield results that are scarcely robust. But recent evidence suggests that what happened in the wake of the Lehman collapse is likely the most severe global financial crisis ever.

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[244] For a discussion of the factors leading to the 2007 liquidity crisis, *see, e.g.*, Markus K. Brunnermeier, "Deciphering the Liquidity and Credit Crunch 2007–2008," *Journal of Economic Perspectives*, vol. 23, no. 1 (Winter 2009).

[245] In an investment context, *information* refers to information relevant to the value of securities. That includes information that can be gleaned from trading activity, such as volume, price, and volatility. In the absence of trading activity, arguably the most significant source of information on the value of the securities effectively disappeared.

[246] "Liquidity: Deal or no deal," *The Economist*, April 26, 2007.

> The evaporation of the global supply of short term credits within hours or days of the Lehman failure is, I believe, without historical precedent. A run on money market mutual funds, heretofore perceived to be close to riskless, was underway within hours of the Lehman announcement of default. The Federal Reserve had to move quickly to support the failing commercial paper market. Unsupported, trade credit withdrawal set off a spiral of global economic collapse within days. Even the almost sacrosanct fully collateralized repurchase agreement market encountered severe unprecedented difficulties.[247]

Or, as he put it in an interview in 2008, this was "a once-in-a-century type of financial crisis."[248]

IX. EVALUATION OF THE PERFORMANCE OF THE LOANS UNDERLYING THE SECURITIES

176. I understand that Plaintiff's allegations in this case are that Defendants made the following four categories of misstatements in their offering documents about the collateral backing the Securities: (1) the collateral was not underwritten "generally in accordance" with guidelines, (2) the LTV ratios for the collateral were understated, (3) the owner-occupancy information provided was inaccurate, and (4) the credit ratings the At-Issue Certificates received were undeserved as a result of misstating characteristics of the collateral to rating agencies.[249] For purposes of this report, I assume those allegations are true and analyze whether they caused the performance of the loans supporting the seven At-Issue Certificates purchased by the GSEs to be worse than would otherwise have been the case, and ultimately whether those alleged defects caused losses to the GSEs as holders of the seven At-Issue Certificates.

[247] Alan Greenspan, "The Crisis," Greenspan Associates LLC, April 15, 2010, pp. 17–18.

[248] "Greenspan: Economy in 'once-in-a-century' crisis," CNN Money.com, September 14, 2008, <http://money.cnn.com/2008/09/14/news/economy/greenspan/> (accessed July 9, 2014).

[249] Complaint.

A. Overview of Benchmarks

177. In this section, I discuss the methodology and results of my analyses, which comprise several "benchmarking analyses" using loan-level data. In general, for these benchmarking analyses, I first identify relevant comparable loans to serve as a benchmark. I then compare and assess the performance of the benchmark loans to the performance of the loans underlying the At-Issue Certificates (the "At-Issue Loans"). The performance metric is the event of default or serious delinquency for an individual loan,[250] which I aggregate to the Supporting Loan Group ("SLG") underlying each At-Issue Certificate to calculate an overall percentage of defaults and serious delinquencies for each SLG. Using this performance measure, I compare the actual performance of the At-Issue SLGs to the performance predicted by the benchmark, controlling for loan and borrower characteristics and changes in economic conditions.

178. The performance estimated by the benchmark, or the "expected" performance, uses the relevant benchmark to provide baseline measures of performance on which to evaluate the default and serious delinquency rates of the At-Issue Loans. Specifically, the benchmarking analyses calculate the expected performance of the At-Issue Loans taking into account macroeconomic changes and loan-level characteristics such as CLTV ratio and owner occupancy status. As I will discuss in further detail below, if the actual default and serious delinquency rates of the SLG are not statistically significantly higher than the expected rates predicted by a particular benchmark, I conclude that the alleged misstatements did not cause the defaults and serious delinquencies experienced by the At-Issue SLGs, according to that benchmark.

[250] Specifically, I define a loan as being in default or serious delinquency if the loan is 90 or more days delinquent, in foreclosure, in bankruptcy, real estate owned, or written off.

179. I compare the performance of the At-Issue SLGs to the performance of three benchmarks.

180. The "Industry Benchmark" includes loans comparable to the At-Issue Loans from private label, or non-agency, securitizations that were issued between 2005 and 2007. I identify comparable loans for this benchmark using CoreLogic's "LoanPerformance" database which provides loan-level data on millions of non-agency loans underlying private label mortgage-backed securities. In addition to providing loan and borrower characteristics known at origination, the LoanPerformance database also contains monthly performance data on each loan.

181. I use several criteria to select comparable loans from LoanPerformance and construct the Industry Benchmark. First, I only keep loans that were securitized between 2005 and 2007. Additionally, I only allow loans with FICO scores and CLTV ratios within the range of values observed for the At-Issue Loans. Along the same lines, I only include loans with origination dates within the range of dates observed for the At-Issue Loans. Furthermore, I exclude loans subject to similar litigations by the Plaintiff,[251] as well as loans that do not have sufficient data to be used in my loan-level models. I provide further detail on my comparable loan selection process and my construction of the Industry Benchmark in **Exhibit 55**.

[251] I exclude loans that are part of securitizations at issue in the FHFA cases related to Fannie Mae and Freddie Macs' purchases of MBS. These 18 cases are listed on the FHFA website (http://www fhfa.gov/Default.aspx?Page=110). I exclude from my analysis all loans from securitizations identified in the complaints associated with these cases. *See* FHFA vs. Ally Financial Inc. et al. pp. 52-53, FHFA vs. Bank of America Corporation et al. pp. 55-56, FHFA vs. Barclays Bank plc et al. p. 40, FHFA vs. Citigoup, Inc. et al. p. 60, FHFA vs. Countrywide Financial Corporation et al. pp. 116-20, FHFA vs. Credit Suisse Holdings (USA), Inc. et al., pp. 80-82, FHFA vs. Deutsche Bank AG et al. pp. 72-74, FHFA vs. First Horizon National Corporation et al. pp. 51-52, FHFA vs. General Electric Company et al. p. 35, FHFA vs. Goldman, Sachs & Co. et al. pp. 87-88, FHFA vs. HSBC North America Holdings Inc. et al. p. 50, FHFA vs. JPMorgan Chase & Co. et al. pp. 186-90, FHFA vs. Merrill Lynch & Co. et al. pp. 96-101, FHFA vs. Morgan Stanley et al. pp. 56-57, FHFA vs. The Royal Bank Of Scotland Group plc et al. pp. 76-79, FHFA vs. SG Americas, Inc. et al. p. 48, all dated September 2, 2011. Note, for the list of UBS certificates involved in FHFA litigation, I relied on the second amended complaint (FHFA vs. UBS Americas Inc. et al. pp. 137-138, December 21, 2011).

182. The "GSE Benchmark" includes comparable loans that were purchased as whole loans by Fannie Mae and Freddie Mac. I identify comparable loans for this benchmark using CoreLogic's Loan-Level Market Analytics ("LLMA") database, which consists of mortgage loan data from most of the top U.S. servicers. This database identifies the type of investor, such as a GSE, that purchased each loan and, similar to LoanPerformance, includes both loan and borrower characteristics known at origination and monthly performance data on each loan.

183. I used several criteria to select comparable loans from the LLMA database and construct the GSE benchmark. I first select loans that were originated between 2005 and 2007, which is the range in which all At-Issue Loans were originated. I use loan origination date rather than securitization date because LLMA does not provide data related to securitization date. As with the Industry Benchmark, the other GSE Benchmark selection criteria include only using loans with FICO scores and CLTV ratios within the range of the At-Issue Loans, as well as only using loans that have sufficient data to be used in my loan-level model. I provide further detail on my comparable loan selection process and my construction of the GSE Benchmark in **Exhibit 55**.

184. The "Reunderwriting Benchmark" includes only loans that, according to the Plaintiff's reunderwriting experts, were underwritten consistent with underwriting guidelines or deviated from guidelines only in a manner that did not substantially increase their credit risk.[252] Plaintiff's expert in the case, Mr. Hunter, states that he re-underwrote a sample of 723 loans from

[252] The Reunderwriting Benchmark includes loans that were reunderwritten by Plaintiff's experts in the following matters: FHFA vs. Ally Financial Inc. et al., FHFA vs. Credit Suisse Holdings (USA), Inc. et al., FHFA vs. First Horizon National Corporation et al., FHFA vs. HSBC North America Holdings Inc. et al., FHFA vs. Merrill Lynch & Co. et al., and FHFA vs. Nomura Holding America Inc. et al. I understand that these were the only cases in which the defendants agreed to share the results of FHFA's reunderwriting exercise with Nomura for use by Nomura in this report.

the loan groups supporting the seven At-Issue Certificates.[253,254] He identified loans that allegedly "suffered from underwriting defects and, as a result, had a substantially increased credit risk" and for which "the compensating factor[s] did not offset the increased credit risk presented by the exception…"[255] In particular, if Mr. Hunter found a loan he believed did not comply with the applicable guidelines, he states that he "evaluated each compensating factor to determine whether one or more were sufficiently strong to offset the identified weakness in the borrower's application package."[256] I refer to loans that Mr. Hunter claims were made in violation of guidelines and that he claims had no adequate compensating factors, such that the defects he found "substantially increased credit risk,"[257] as "Hunter Defective Loans." I combine the loans identified by Mr. Hunter as non-defective with loans identified by FHFA reunderwriting experts as non-defective in several other FHFA matters. The pooling of these loans provides a robust sample of loans, collectively identified by the Plaintiff's experts as non-defective.

185. The results of my benchmarking analyses are as follows. I find that the Industry Benchmark explains the default and serious delinquency rates for nearly all of At-Issue SLGs. Of the seven SLGs at issue in this case, only one SLG had actual default and serious delinquency rates that were statistically significantly higher than expected. In other words, six of the seven

[253] Mr. Hunter re-underwrote 131 loans from NAA 2005-AR6 Class 3-A-1, 100 loans from NHELI 2006-FM1 Class 1-A, 100 loans from NHELI 2006-FM2 Class 1-A-1, 99 loans from NHELI 2006-HE3 Class 1-A-1, 98 loans from NHELI 2007-1 Class 2-1-A, 98 loans from NHELI 2007-2 Class 1-A-1, and 97 loans from NHELI 2007-3 Class 1-A-1. Hunter Report, p. 3.

[254] The analyses I perform using Mr. Hunter and other Plaintiff's experts' underwriting findings should not be considered an endorsement of the reliability of their findings, including whether the samples of loans that they re-underwrote are random and representative samples.

[255] Hunter Report, p. 3 and p. 97.

[256] Hunter Report, p. 97.

[257] Hunter Report, p. 3.

SLGs, which include 98 percent of the At-Issue Loans,[258] performed as well as or better than expected when compared to the Industry Benchmark.

186. My analysis based on the GSE Benchmark explains the actual default and serious delinquency rates for all of the SLGs. None had actual default and serious delinquency rates that were statistically significantly higher than expected. Thus, all of the seven SLGs performed in line with the GSE Benchmark.

187. My analysis based on the Reunderwriting Benchmark explains the actual default and serious delinquency rates for the same six SLGs that performed in line with the Industry Benchmark. Only one SLG, which includes only two percent of the At-Issue Loans, had actual default and serious delinquency rates that were statistically significantly higher than expected.

B. General Approach to Benchmarking Analyses of Default and Serious Delinquency

188. In order to evaluate the performance of the loans underlying the Securities, I compare the performance of the loans underlying the Securities to that of the loans in each of the benchmarks. Specifically, I use regression analysis to estimate a model of loan performance using the loans in each benchmark.[259] The regression analysis estimates the relationship between

[258] The seven At-Issue SLGs that support the seven At-Issue Certificates include, in total, 15,780 loans. The one At-Issue SLG with statistically significantly higher than expected default and serious delinquency rates which supports NAA 2005-AR6 Class 3-A-1 includes 375 loans.

[259] Regression analysis is a widely used technique that I have used frequently in my empirical research. As an introductory textbook notes: "Regression analysis is concerned with the study of the dependence of one variable, the dependent variable, on one or more other variables, the explanatory variables, with a view to estimating and or predicting the (population) mean or average value of the former in terms of the known or fixed (in repeated sampling) values of the latter." Gujarati, Damodar N., *Basic Econometrics*, Second Edition, McGraw-Hill,1988, p. 14.

relevant disclosed loan and borrower characteristics and changes in macroeconomic conditions, on the one hand, and the event of loan default or serious delinquency, on the other hand.[260]

189. Based on the relationships observed for the benchmarks, I estimate the expected probability that each loan underlying the Securities will become seriously delinquent or default based on the reported loan and borrower characteristics and changes in macroeconomic conditions specific to the geographic location of the loan. I then aggregate those estimates to the relevant SLG to determine the expected default and serious delinquency rates for the loans in that SLG. If the expected default and serious delinquency rates for an SLG (calculated from the benchmark) are higher than the actual default and serious delinquency rates for that SLG, then I conclude that the loans in that SLG performed similarly to or better than comparable loans in the benchmark. If the expected default and serious delinquency rates based on the benchmark are statistically significantly lower than the actual default and serious delinquency rates for an SLG, then I conclude that the loans in that SLG statistically significantly underperformed comparable loans in the benchmark.

190. I describe my analyses in detail in the following subsections. I first explain my loan-level regression model, including a description of the loan and borrower characteristics that have been found to explain differences in default and serious delinquency rates in the economic literature. Next, I describe the results of my regression analyses and how I use each model to compare the performance of the loans in the At-Issue SLGs to that of comparable loans in the benchmark.

[260] In addition, the model estimates the probability of prepayment. *See* **Exhibit 55** for additional details on my regression analysis.

1. Description of Regression Model

191. When comparing the performance of loans, it is important to take into account relevant loan and borrower characteristics and changing economic conditions that are known to affect the riskiness of mortgage loans. I illustrate the importance of these factors by comparing the performance of loans in the Industry Benchmark that are of the same collateral type (First-Lien Fixed Rate, First-Lien ARM/Hybrid, or CESL) and the same asset type (Alt-A or Subprime).[261] For example, as described above, loans with higher CLTV ratios at origination would be expected to have higher rates of default, as they have relatively less homeowner's equity. Within the collateral and asset type categories, loans with a CLTV at origination above the median CLTV experienced higher rates of default and serious delinquency (*see* **Exhibit 56**). Similarly, borrowers with lower FICO scores would be expected to default at higher rates than borrowers with higher FICO scores. Industry Benchmark loans with a credit score at origination below the median credit score generally experienced higher rates of default and serious delinquency (*see* **Exhibit 56**).[262] Likewise, full documentation loans would be expected to have a lower risk of default. Across the collateral and asset type categories, average default and serious delinquency rates for full documentation loans were between six to 12.7 percentage points lower than default and serious delinquency rates for non-full documentation loans (*see* **Exhibit 56**).

192. Macroeconomic conditions can differ across geographic locations. Arizona, California, Florida and Nevada experienced more severe declines in housing prices than the rest

[261] As explained below, the At-Issue Loans fall into four collateral/asset type categories: First-Lien Fixed Rate Subprime, First-Lien ARM/Hybrid Alt-A, First-Lien ARM/Hybrid Subprime, and CESL Subprime. I compare the performance of Industry Benchmark loans within each of these four categories.

[262] The only exception is the ARM-Hybrid/Subprime category for which the average default rate of loans with below median FICO score was one percent lower than the default rate of loans with above median FICO score.

of the country and also experienced very large increases in unemployment.[263] Consequently, default and serious delinquency rates are higher for the loans in those four states than for loans in other states (*see* **Exhibit 56**).

193. Because of these differences in known risk characteristics, it would be inappropriate to compare the performance of different loans without taking such differences into account. Regression analysis allows me to control for differences in loan and borrower characteristics as well as for the changes in macroeconomic conditions specific to the geographic location of the property associated with each loan.

194. To estimate the expected performance of the loans in the At-Issue SLGs, I estimate the relationship between loan performance (that is, the occurrence of serious delinquency and default as opposed to remaining current or prepaying) and loan and borrower characteristics and changes in macroeconomic conditions for the comparable loans in each of my benchmarks using regression analysis.[264] As I described in Section VI, a variety of loan and borrower characteristics, along with macroeconomic conditions such as house prices and unemployment, are relevant for analyzing differences in loan performance. For example, in Section VI, I discussed the importance of lien position and collateral type (such as first lien versus second lien and Fixed Rate versus ARM/Hybrid). Similarly, asset type (for example, Alt-A versus Subprime) is an important factor affecting the riskiness of the loan. To account for these differences among loans, I either (1) use the benchmarks to estimate different sets of relationships for the different collateral type and asset type combinations of the At-Issue Loans (First-Lien Fixed Rate Subprime, First-Lien ARM/Hybrid Alt-A, First-Lien ARM/Hybrid

[263] *See* **Exhibits 47 and 48**.

[264] I discuss the details of my model in **Exhibit 55**.

Subprime, and CESL Subprime), or (2) pool all comparable loans and estimate one relationship while I include dummy variables indicating collateral type and asset type categories so that the benchmark can predict differences due to those attributes.[265]

195. In addition, my model accounts for other differences in loan and borrower characteristics known to affect the risk of a loan, which I discussed in Section VI of this report. Those characteristics include CLTV, credit score, loan documentation, residency status, unemployment, and home equity. I also include the following additional explanatory variables in my regression analysis: [266]

a. Loan size – Larger loans represent a greater financial obligation for the borrower and empirical studies have found that loans with a larger loan balance are more likely to default.[267] Theoretically, however, there is no clear prediction regarding the effect of loan size on the probability of default.

b. Loan purpose – Mortgage loans may be used to purchase a home or to refinance existing loans. Some academic studies have found that default is less likely for loans used for refinancing,[268] whereas others have found that default is more likely for

[265] I follow the first approach with respect to the Industry Benchmark. For the GSE Benchmark, I follow the same approach but exclude CESL, due to the smaller sample size, and pool together the First-Lien ARM/Hybrid Alt-A and the First-Lien ARM/Hybrid Subprime categories due to the small sample size of the latter. In the Reunderwriting Benchmark, the samples size of the collateral/asset categories do not allow me to estimate a separate regression for each category and, therefore, I follow the second approach.

[266] The inclusion of these explanatory factors in my analyses depends on whether there were loans in each regression with a range of characteristics for each factor. For example, if there are no or very few comparable CESL Subprime that were originated in 2007 for a particular benchmark, the explanatory factor indicating this characteristic is excluded from the regression of CESL Subprime for that benchmark.

[267] Demyanyk, Yuliya, and Otto Van Hemert, "Understanding the Subprime Mortgage Crisis," *The Review of Financial Studies*, 2011.

[268] Demyanyk, Yuliya, and Otto Van Hemert, "Understanding the Subprime Mortgage Crisis," *The Review of Financial Studies*, 2011.

loans used for refinancing.[269] My analysis includes a variable that indicates whether or not a loan was used to purchase a home.

c. Year of Origination and Vintage – Industry-wide, disclosed underwriting guidelines (not captured by those characteristics explicitly included in the model) changed over time and, therefore, expected performance may vary depending on the year of loan origination and vintage of securitization.[270]

d. Property type – Residential mortgages are secured by many property types. For example, the property type may be a single-family home or a multi-unit condominium facility. Some academic studies have found that loans collateralized by single-family homes are less likely to default than other properties.[271] My analysis includes an indicator variable for whether or not the property type is a single-family home.

e. Interest-only – A loan is categorized as interest-only if, for a set term, a borrower pays only the interest on the principal balance while the principal balance remains unchanged. Academic studies have found that interest-only loans tend to have lower default rates during the interest-only period, but higher default rates afterward, likely because monthly payments adjust upward.[272] My analysis includes indicator

[269] Constantinou, Nick and Jose Molina Utrilla, "Could the Subprime Crisis have been Predicted? A Mortgage Risk Modeling Approach," University of Essex Working Paper, November 2010.

[270] Demyanyk, Yuliya, and Otto Van Hemert, "Understanding the Subprime Mortgage Crisis," *The Review of Financial Studies*, 2011.

[271] Gerardi, Kristopher, Adam Hale Shapiro, and Paul S. Willen, "Subprime Outcomes: Risky Mortgages, Homeownership Experiences, and Foreclosures," Federal Reserve Bank of Boston Working Paper, No. 07-15, May 4, 2008.

[272] Sherlund, Shane, "The Past, Present, and Future of Subprime Mortgages," Finance and Economics Discussion Series, Divisions of Research & Statistics and Monetary Affairs, Federal Reserve Board, Washington, D.C., November 2008.

variables for the various interest-only term lengths observed in the data for each loan type.

f. Balloon payment – A balloon payment mortgage is a mortgage that does not fully amortize over the term of the loan, thus leaving a balance – or balloon payment – due at maturity. A recent study found that loans with a balloon payment are more likely to default than loans without a balloon payment.[273]

g. Prepayment penalty – A loan is said to have a prepayment penalty if a penalty is imposed on a borrower if he/she pays off the principal balance of his/her loan prior to a contractually agreed date (often three years after origination). Prepayment penalties are expected to reduce the probability of prepayment during the penalty period. I include an indicator variable for prepayment penalties because my loan-level model estimates default and prepayment probabilities jointly.

h. Amortization term – The amortization term is the period over which the loan's principal balance is amortized, and is used to calculate a borrower's monthly payments. My analysis includes indicator variables for amortization terms of less than or equal to 20 years, between 20 and 30 years, and greater than 30 years.

196. I also account for the compound effect of multiple loan characteristics (which I referred to earlier as "risk layering")[274] by including a set of interaction variables. Including an interaction variable allows me to estimate the combined effect of two different variables, as well

[273] Demyanyk, Yuliya, and Otto Van Hemert, "Understanding the Subprime Mortgage Crisis," *The Review of Financial Studies*, May 4, 2011.

[274] Risk layering occurs when two or more nontraditional loan characteristics are present. *See* Krinsman, Allan, "Subprime Mortgage Meltdown: How did It Happen and How will It End?" *Journal of Structured Finance,* Volume XIII, Number 2, Summer 2007, p. 3.

as individual effects.[275] For example, a low credit score increases the probability of default, as does providing reduced documentation. However, the effects of both low credit scores and reduced documentation together may compound, resulting in even higher defaults and serious delinquencies than each characteristic alone. Interaction variables allow me to capture this compounding effect. I provide additional details on how I define my independent and dependent variables in **Exhibit 55**.

2. Results of Regression Analysis Using Industry Benchmark

197. I report the results of my Industry Benchmark regression analysis for each of the At-Issue Loan categories (First-Lien Fixed Rate Subprime, First-Lien ARM/Hybrid Alt-A, First-Lien ARM/Hybrid Subprime, and CESL Subprime) in **Exhibits 57A and 57B.** The regression results show that, as of December 2013, borrowers with higher FICO scores are less likely to default for all collateral/asset type categories.[276] The results also show, for all collateral/asset type categories, loans with lower CLTV, loans with full documentation, and loans for properties intended to be used as primary residences, are less likely to default.[277]

198. Next, I use my model and the regression results to calculate the expected default and serious delinquency rate for each of the loans in the At-Issue SLGs based on the performance of the loans in the Industry Benchmark. That is, using the loan and borrower characteristics of the loans and accounting for changes in macroeconomic conditions, I calculate

[275] A description of interaction variables can be found in: Greene, William, *Econometric Analysis*, Fifth Edition, Prentice Hall, 2003, pp. 123-124.

[276] As discussed, my model accounts for risk layering by including a set of interaction variables. As a result, to calculate the overall estimated effect (on the probability of default and serious delinquency) of a change in the value of an explanatory variable (e.g., FICO Score) that interacts with other explanatory variables, I compute the total effect, which requires accounting for all interactions of that explanatory variable with other relevant explanatory variables. For further discussion and detailed calculations, see Note [5] in **Exhibit 57A**.

[277] The results of the Industry Benchmark regression analysis as of the lawsuit date (September 2011) are reported in **Exhibits 58A and 58B**.

an expected default and serious delinquency probability for each individual At-Issue Loan. This can be thought of as the expected performance of each of the loans, assuming each performed like the loans in the Industry Benchmark, controlling for loan and borrower characteristics and changes in macroeconomic conditions. The expected probability of default and serious delinquency for each loan is aggregated to the relevant SLG to arrive at the expected default and serious delinquency rate for the SLG. This expected default and serious delinquency rate for the SLG underlying the Security is then compared to the actual default and serious delinquency rate for the SLG.

199. **Exhibit 59** provides a comparison of actual and expected default and serious delinquency rates using the Industry Benchmark regression analysis as of December 2013. If the actual default and serious delinquency rates were statistically significantly lower than expected or not statistically significantly different than expected, I consider the SLG to have performed better than or in line with the Industry Benchmark. I find that loans in the SLGs underlying six of the seven Securities outperformed or performed in line with the Industry Benchmark, meaning that the alleged misstatements did not cause any decline in the value of these six At-Issue Certificates. For the certificate NAA 2005-AR6 Class 3-A-1, the actual percentage of defaults and serious delinquencies is statistically significantly higher than the performance predicted by the Industry Benchmark. In other words, the regression analysis indicates that the loans in the loan group supporting this certificate underperformed comparable loans in the Industry Benchmark.[278]

[278] A comparison of actual and expected default and serious delinquency rates based on the regression analysis as of the lawsuit date (September 2011) is reported in **Exhibit 60**.

3. Results of Regression Analysis Using GSE Benchmark

200. I report the results of my GSE Benchmark regression analysis in **Exhibits 61A and 61B**.[279] In **Exhibit 62**, I compare the actual and expected default and serious delinquency rates based on the GSE Benchmark for each of the SLGs underlying the Securities. My analysis based on the GSE Benchmark explains the actual default and serious delinquency rates for all of the SLGs. No SLG had actual default and serious delinquency rates that were statistically significantly higher than expected. Thus, all of the seven SLGs performed in line with the loans in the GSE Benchmark.[280]

4. Results of Regression Analysis Using Reunderwriting Benchmark

201. I report the results of my Reunderwriting Benchmark regression analysis in **Exhibits 63A and 63B**. The Reunderwriting Benchmark analysis provides additional support to the findings of the Industry and the GSE Benchmarks. **Exhibit 64** compares the actual and expected default and serious delinquency rates using the Reunderwriting Benchmark. Only the SLG supporting NAA 2005-AR6 Class 3-A-1 has actual default and serious delinquency rates that are statistically significantly higher than the expected default and serious delinquency rates predicted by the Reunderwriting Benchmark.

5. Summary of Benchmarking Analyses

202. Taken together, my benchmarking analyses show that the disclosed loan and borrower characteristics and the change in macroeconomic conditions – factors unrelated to the

[279] For the GSE Benchmark, I exclude CESL due to its relatively smaller sample size in the LLMA database, and pool together the asset type categories due to the small sample size of the Subprime loans.

[280] As an additional check, I estimated my model using the GSE Benchmark by collateral/asset type category and used the estimated parameters to predict the performance of the At-Issue Loans. The results did not materially change: all of the seven SLGs performed in line with the loans in the GSE Benchmark.

origination of the At-Issue Loans or any alleged misrepresentations about their characteristics – explain the defaults and serious delinquencies of six of the seven SLGs, at a minimum, which include 98 percent of the At-Issue Loans. This supports the conclusion that, in general, the alleged misstatements did not cause the defaults and serious delinquencies experienced by the At-Issue Loans. In other words, those defaults and serious delinquencies would have occurred irrespective of the truth or falsity of Plaintiff's allegations.

203. I have also reviewed the Expert Report of Stephen G. Ryan, and his opinions support my own. Professor Ryan concluded, based on Fannie Mae and Freddie Mac's internal accounting documents, as well as their public financial reports, that the GSEs determined that much of the loss of value the At-Issue Certificates experienced (that is, value if sold on the market) was driven by changes in financial market conditions, such as financial market illiquidity and risk aversion, rather than attributable to the quality of mortgage underwriting or other security-specific factors.[281] Professor Ryan further concluded that even the portion of loss in value attributed to an expected shortfall in cash flows for particular At-Issue Certificates (rather than due to market conditions) was attributable, at least in significant part, to changes in economic conditions such as house price depreciation and unemployment.[282]

C. Loan-Level Industry Benchmarking Analysis of Dollar Losses

204. Next, I calculate the expected dollar losses and total actual dollar losses for the loan group supporting NAA 2005-AR6 Class 3-A-1, which had a default and serious delinquency rate that was statistically significantly higher than predicted by two of my three benchmarks, as of December 2013 and September 2011. The expected dollar losses of this loan

[281] Expert Report of Stephen G. Ryan, Section VII.

[282] *Id.*

group are the losses that are explained by the loan and borrower characteristics and changes in economic conditions and therefore are due to factors that are unrelated to the alleged misstatements. The total actual dollar losses are calculated as described in **Exhibit 55**.

205. I calculate expected dollar losses by first calculating the expected loss severity of the loans, defined as the percentage of the original principal balance that is lost when the loan liquidates. The expected loss severity of the loans in the loan group supporting NAA 2005-AR6 Class 3-A-1 is determined by using a regression model to estimate the relationship between the loss severity of the Industry Benchmark loans that have defaulted and liquidated and various factors that affect loss severity. The estimated parameters of this model are used to calculate the expected loss severity, conditional on default, of the At-Issue loans given their loan and borrower characteristics and changes in economic conditions. To calculate the expected dollar amount of losses, I combine the expected loss severity with the expected probability of default and serious delinquency that is calculated using the benchmarking default model. See **Exhibit 55**.

1. Description of Regression Model

206. The regression model estimates the relationship between loss severity (the percentage of the original principal loan balance that is lost when the loan is liquidated) and the following explanatory variables:

a. Equity Loss – This variable measures the percentage of the loan balance (measured by lien amount) that exceeds the funds available for repayment in the event of liquidation.[283] All other factors being equal, the lower the property value relative to the loan amount (or, for second lien loans, the property value that would remain after the first lien is

[283] For example, first lien loans would be compensated by the property's sale value, with second lien loans being repaid with whatever sale value exceeded the first lien amount. The calculation of this variable is given in **Exhibit 55**.

compensated), the less money available to compensate the lender in the event of liquidation, resulting in larger loss severity.[284]

b. Original loan balance – Smaller loans may have higher loss severities because foreclosure and sale costs (*e.g.*, attorney fees) are relatively fixed.[285]

c. Loan purpose – A mortgage can be originated either to fund the purchase of a home or to refinance an existing loan. Research has identified loan purpose as a determinant of loss severity.[286]

d. Residency status – Borrowers who intend to occupy the property they are purchasing, or who currently reside in the home in the case of refinance loans, may maintain the home better than those who purchase investment property, leading to higher sale prices and lower losses in the event of foreclosure. Research suggests that the occupancy status of a property is a determinant of loss severity.[287]

e. Property type – Loans on residential properties can be taken out for single-family homes or other types of property, such as condominiums and multiple family homes. Different types of properties may be more or less liquid, which will impact the price at which the home sells in the event of foreclosure.

f. Year of Securitization - The year in which a loan is securitized refers to the year when the securitization was issued. In this matter, the At-Issue Securities were issued from 2005 through 2007.

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[284] Tang, Q., et al., "RMBS Insight: U.S. Residential Mortgage-Backed Securities Loss Model and Rating Methodology," *DBRS*, October 2011, pp. 18-19.

[285] Qi, M. and Yang, X., "Loss Given Default of High Loan-to-Value Residential Mortgages," *Journal of Banking and Finance,* Vol. 33, 2009, pp. 788-799.

[286] Watkins, J. and Hunt, B., "ResiLogic: U.S. Residential Mortgage Loss Model Technical Document," *Fitch Ratings,* January 18, 2007, p. 8.

[287] Watkins, J. and Hunt, B., "ResiLogic: U.S. Residential Mortgage Loss Model Technical Document," *Fitch Ratings,* January 18, 2007, p. 8.

g. Year of origination – The loan origination year refers to the year in which a particular loan was made to a borrower. These variables are likely to pick up changes in the disclosed underwriting standards over time, which may impact the riskiness of the loan and the costs associated with the recovery process of a liquidated loan.

h. Change in Unemployment – Research indicates that loans that default in areas with depressed economic conditions are likely to have higher levels of loss severity. [288] Higher levels of unemployment may decrease demand for homes, reducing the price received for a foreclosed home, increasing the liquidation time, and ultimately resulting in higher loss severity.

i. Age of the loan since origination measured as the number of months following origination.

207. Additionally, I include credit score, CLTV, and loan documentation as explanatory variables to control for the mortgage risk premium, because research has shown that mortgage risk premium is associated with higher loss severity.[289]

208. Using the Industry Benchmark loans, I estimate a separate loss severity regression for each of the four collateral and asset type categories of the At-Issue Loans (First-Lien Fixed Rate Subprime, First-Lien ARM/Hybrid Alt-A, First-Lien ARM/Hybrid Subprime, and CESL Subprime) as of December 2013 and September 2011. I provide additional details regarding the explanatory variables used in the loss severity model and regarding the specification of the loss severity model in **Exhibit 55**.

[288] Qi, M. and Yang, X., "Loss Given Default of High Loan-to-Value Residential Mortgages," *Journal of Banking and Finance,* Vol. 33, 2009, pp. 788-799.

[289] Stein, R., Das, A., Ding, Y., and Chinchalkar, S., "Mortgage Portfolio Analyzer: A Quasi-Structural Model of Mortgage Portfolio Losses," *Moody's Research Labs*, March 4, 2011, p. 32.

2. Results of Regression Analysis

209. The results of the loss severity regressions as of December 2013 for the four collateral and asset type categories are reported in **Exhibits 65A1.** As expected, the coefficient of equity loss is positive and statistically significant implying that loss severity increases when there are larger declines in house prices. [290,291]

210. I use the estimated loss severity model parameters to calculate the expected loss severity for At-Issue Loans underlying the loan group supporting NAA 2005-AR6 Class 3-A-1 given their loan and borrower characteristics and changes in economic conditions. Then, I calculate the dollar amount of losses that would be predicted by combining the expected default and serious delinquency rates with the expected loss severity.

211. The total actual dollar losses and the expected dollar losses as of December 2013 for the loan group supporting NAA 2005-AR6 Class 3-A-1 are reported in **Exhibit 66A1**. Total actual dollar losses of $20.3 million are higher than expected dollar losses of $10.6 million by $9.7 million. This analysis shows that $10.6 million – more than half – of total actual dollar losses for the loan group supporting NAA 2005-AR6 Class 3-A-1 as of December 2013 are explained by loan and borrower characteristics and changes in economic conditions, implying that a large portion of any losses to the SLG supporting this certificate (and, hence, any potential losses to the At-Issue Certificate itself) are attributed to industry and economy-wide market factors unrelated to Plaintiff's allegations.

212. The total actual dollar losses and expected dollar losses as of September 2011 for the loan group supporting NAA 2005-AR6 Class 3-A-1 are reported in **Exhibit 66A2**. Total

[290] The coefficient for equity loss is smaller for CESLs Subprime compared to the results in the other three regressions. The relationship between equity loss and loss severity is typically weaker for CESLs, because CESLs are subordinate to first liens and even small losses in equity result in zero recovery for CESLs.
[291] The results of the loss severity regressions as of September 2011 are reported in **Exhibit 65A2.**

actual dollar losses of $17.8 million are higher than expected dollar losses of $9.1 million by $8.6 million. This analysis shows that $9.1 million – more than half – of the total actual dollar losses for the loan group supporting NAA 2005-AR6 Class 3-A-1 as of September 2011 are explained by loan and borrower characteristics and changes in economic conditions, implying that a large portion of any losses to the SLG supporting this certificate (and, hence, any potential losses to the At-Issue Certificate itself) are attributed to industry and economy-wide market factors unrelated to Plaintiff's allegations.

X. ADDITIONAL LOAN PERFORMANCE ANALYSIS BASED ON PLAINTIFF'S REUNDERWRITING RESULTS

213. In addition to these benchmarking analyses, I undertake a further analysis that examines and compares the performance of loans that have been reunderwritten. If Mr. Hunter's underwriting defect determinations were material to loan performance, one would expect to find, all else being equal, that Hunter Defective Loans performed worse than those loans he did not find to be in violation of the guidelines ("Hunter Non-Defective Loans"). To compare the percentage of defaults and serious delinquencies between Hunter Defective Loans and Hunter Non-Defective Loans, I employ a regression model that includes a similar set of explanatory variables as in my industry benchmarking analysis, but now includes an indicator variable that identifies Hunter Defective Loans. I find that the probability of default or serious delinquency is not statistically significantly different for Hunter Defective Loans than for the Hunter Non-Defective Loans for any of the SLGs supporting the At-Issue Certificates.

214. In his expert report, Plaintiff's expert Mr. Hunter re-underwrote a sample of 723 loans from the loan groups supporting the seven At-Issue Certificates. The percentage of Hunter Defective Loans ranges from 74 percent (NHELI 2007-3 Class 1-A-1) to 85 percent (NHELI

2006-FM2 Class 1-A-1).[292] As an initial matter, if such a large percentage of the loans had underwriting defects and these defects increased the risk of default, one would expect that the seven loan groups supporting the At-Issue Certificates would have experienced a statistically significantly higher percentage of defaults and serious delinquencies than expected based on the benchmarks. According to the three benchmarking analyses presented above, at most only one SLG (underlying NAA 2005-AR6 class 3-A-1) statistically significantly underperformed the benchmarks. These findings call into question the reliability of Mr. Hunter's findings.

215. Furthermore, if Mr. Hunter's underwriting defect determinations were material to loan performance, one would expect to find, all else being equal, that Hunter Defective Loans performed worse than those loans he did not find to be in violation of the guidelines. To compare the rates of defaults and serious delinquencies between Hunter Defective Loans and Hunter Non-Defective Loans, I use a regression model that includes a similar set of explanatory variables as in my industry benchmarking analysis, but now includes an indicator variable that identifies Hunter Defective Loans, indicators for each of the Securities, and interactions between the Hunter Defective Loan indicator and Security indicators.[293] The observations used in the regression are all the loans re-underwritten by Mr. Hunter for this case: Non-Defective and Defective. I report the regression results in **Exhibit 67**.

216. Using the estimated coefficients on the Hunter Defective Loan indicator and the interactions between the Hunter Defective Loan indicator and the Security indicators, I test

[292] Hunter Report, p. 3.

[293] Due to the small sample size, I am unable to use the same multinomial panel logit model specification that I use for the industry benchmarking analysis. Instead, I use a multinomial cross sectional logit model specification, where the dependent variable describes the loans status (current, prepaid, or default) as of December 2013. Rather than monthly observations, I include a single observation for each loan, with performance measured as of December 2013 and equity and the change in unemployment measured as of December 2013 if the loan is still current as of December 2013, and as of the date of default, serious delinquency, or prepayment otherwise. *See* **Exhibit 67** for additional information.

whether Hunter Defective Loans are statistically more likely to default or become seriously delinquent than Hunter Non-Defective Loans for each of the SLGs supporting the At-Issue Certificates, after controlling for loan and borrower characteristics and changes in macroeconomic conditions.[294] I find that the probability of default or serious delinquency is not statistically significantly different for Hunter Defective Loans than for the Hunter Non-Defective Loans for any of the SLGs supporting the At-Issue Certificates.[295]

217. The performance of the loans underlying the Securities relative to the benchmarks and the performance of the Hunter Defective Loans relative to the Hunter Non-Defective Loans disprove Mr. Hunter's opinions as to alleged increased risk of loans originated (according to Mr. Hunter) in violation of underwriting guidelines. Based on these findings, one cannot conclude that Hunter Defective Loans are more likely to default or become seriously delinquent than Hunter Non-Defective Loans. My analyses support the conclusion that either Mr. Hunter's re-underwriting results are not reliable or that his alleged underwriting defects are not material to the performance of the loans in the SLGs.

XI. CONCLUSION

218. The substantial growth and the sudden, catastrophic decline in the housing market and the mortgage industry during the course of the last decade were unprecedented. Although market participants and observers understood that even a modest decline in home prices could

[294] For each Security, I test whether the sum of the coefficients on the Hunter Defective Loan indicator and the interaction between the Hunter Defective Loan indicator and the indicator for the Security is statistically significantly different from zero. If I cannot reject the null hypothesis that the sum of the coefficients is equal to zero, I conclude that the probability of default or serious delinquency is not statistically significantly different for the Hunter Defective Loans and Hunter Non-Defective Loans in that Security.

[295] As a check, I also estimate a separate regression for each SLG supporting the At-Issue Certificates. The results from these regressions corroborate my overall findings, showing that the probability of default or serious delinquency is not statistically significantly higher for Hunter Defective Loans.

adversely affect the financial health of the primary and secondary mortgage markets, most failed to anticipate the rapidity and severity of the decline.

219. The principal factors that led to the growth in home prices and mortgage markets were numerous and mutually reinforcing. These factors included governmental policies promoting homeownership and lending, extraordinarily low interest rates, and a sustained period of economic growth. The result was an increase in consumer demand for both homes and mortgages. A number of financial innovations led to the ready supply of capital, which facilitated significant increases in mortgage lending, homeownership, and home prices.

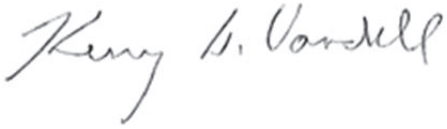
220. The factors contributing to the decline in the housing and mortgage markets were likewise numerous and mutually reinforcing. Decreased demand for housing coupled with excess supply caused prices to soften. Negative equity and rising unemployment limited borrowers' abilities to obtain loans and to refinance existing loans. Defaults and foreclosures increased, leading to further price declines. In the boom-and-bust cycle experienced in the housing market and the broader economy, virtually all participants in the mortgage industry suffered losses. The losses were the direct result of a market-wide increase in defaults and delinquencies, which were in turn, the result of numerous endogenous and exogenous factors, particularly the systemic, sudden, rapid, and unprecedentedly deep declines in home prices and the rapid deterioration of the global economy.

221. I evaluate Plaintiff's allegations regarding misstatements in the Defendants offering documents by comparing the performance of the loans in the loan groups supporting the seven At-Issue Certificates to the performance of various benchmarks comprised of comparable loans. My findings support the conclusion that the alleged misstatements did not cause the defaults and serious delinquencies experienced by, at a minimum, six of the seven At-Issue

SLGs, which include 98 percent of the loans underlying the At-Issue Certificates. For the SLG supporting the NAA 2005-AR6 Class 3-A-1 certificate, which statistically significantly underperformed the Industry and Reunderwriting Benchmarks, I calculate expected dollar losses of $10.6 million as of December 2013 using the Industry Benchmark. It follows that $10.6 million of the $20.3 million total actual dollar losses of this SLG as of December 2013 are attributed to industry and economy-wide market factors unrelated to Plaintiff's allegations. I do the same analysis as of September 2011, which calculates expected dollar losses of $9.1 million using the Industry Benchmark. It follows that $9.1 million of the $17.8 million total actual dollar losses of this SLG as of September 2011 are attributed to industry and economy-wide market factors unrelated to Plaintiff's allegations.

222. I also evaluated whether loans identified by Mr. Hunter, Plaintiff's reunderwriting expert, as defective performed any differently in terms of serious delinquencies and defaults than loans identified by Mr. Hunter as not defective, or defective only in ways that did not significantly increase the credit risk of the loan. I found that after accounting for disclosed loan characteristics and market changes, there was no statistically significant difference in default and serious delinquency rates. This indicates that either Plaintiff's reunderwriting findings are not reliable, or that any defects were not material to the defaults and serious delinquency rates experienced by loans in the At-Issue SLGs.

Signed on the 9th day of July, 2014, at Los Angeles, California.



Kerry D. Vandell, Ph.D.